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THE DEADLY TOXIC EFFECT OF THE "RANUNCULUS FLAMMULA" ON THE HORSE.

BY R. A. STOCK, F.R.C.V.S., LEWES.

PERUSING the Journal for April, I noticed a case of "Hellebore Poisoning," by Mr. J. B. Gresswell, of Louth. From reading it I am induced to offer the following for publication, should it be deemed worthy of insertion. Many instances of poisoning by both vegetable and mineral toxic agents—amongst which may be enumerated yew, colchicum bulbs, hellebore, aconite, nux vomica, ergot of rye, corrosive sublimate, arsenic, ferri sulph., etc.—have come under my notice during twenty years' practice. I fully endorse Mr. Gresswell's remarks, and add that, for some occult reason, the persons brought into daily contact with the lower animals seem imbued with an inherent mania for "doctoring" them, perpetrating blunders and cruelties for which they are wholly irresponsible. Pages might easily be written on the shocking sufferings of animals brought under the notice of a veterinary surgeon in the course of a year in a small district, due to the above causes. What then, I ask, does the whole amount to throughout the length and breadth of the British Isles? Truly a mighty and appalling total, the outcome of *ignorance*, *greed*, *cunning*, and *carelessness*, against which it seems hopeless to struggle.

On the evening of March 6th, 1884, I was summoned by telegram to attend immediately some horses very ill, the property of Messrs. Medhurst and Sons, Isfield Flour Mills, situated between this town and Uckfield. On my arrival I found the horses used by the firm were three in number, viz., grey gelding, bay mare, and black cob. The day previous the grey gelding and bay mare had been sent in double harness with a van-load of flour, etc.,

round the country, returning *viâ* Uckfield; the black cob going in a contrary direction, with a lighter load; all the horses appearing to be in their usual health. When in the main street at Uckfield, the grey was observed to falter in his going, and, reeling in the shafts, he finally fell, and quickly died. The bay mare drew home the empty waggon. The owners attributed his death to some sudden disease, and did not in consequence institute a *post-mortem* examination. The bay mare and cob were taken ill the next morning, and in the evening I was sent for. My attention was first directed to the black cob, his case being considered the worst. An examination showed that he was "*in extremis*," it being highly dangerous to approach him, as, with pendulous head nearly touching the ground, he threw himself with great violence in any direction, turning complete somersaults and lying in most extraordinary positions. In about twenty minutes death put an end to his sufferings. The bay mare, an animal seven years old, about 15 hands high, and in good condition, presented the following symptoms: When standing, pawing with one foot, then the other, tossing her head up and down, eversion of the upper lip, looking round long and anxiously at her flanks, very often lying down, *which she did most carefully;* dulness, great prostration of vital powers; pulse 90, almost imperceptible; conjunctivæ redder than normal, œdematous, with yellow tinge; buccal membranes strikingly white; tongue coated; teeth firmly clenched; ears, extremities, and surface of body, deathly cold; *skin dry;* abdomen tympanitic, tender to pressure; absence of all sounds on auscultation. Her temperature, I regret to state, I was unable to obtain, having forgotten my thermometer. My prognosis was death; she succumbed a few hours after, in spite of the remedial measures adopted. The opinion I gave was that the horses had died from the effects of a vegetable narcotico-acrid poison, but what it was I could not determine. The symptoms were those of Gastro-enteritis of a sub-acute form, *i.e.*, not attended with violent and excruciating pain. On the morning of the 7th, the owners being extremely anxious and puzzled to account for this extraordinary occurrence, requested me to make a *post-mortem* examination, which I did. The lesions in both cases were identical, and were confined to the stomach and intestines, or rather the whole of the alimentary canal. The œsophagus was very much swollen throughout its entire length; stomach, externally, looked hard and very constricted. On making an incision, a small quantity of dark-coloured fluid (its only contents) escaped. It was enormously thickened, due to the exudation of a yellow serous fluid between its coats. This condition extended to the whole of the intestines, causing complete occlusion in many parts of the small ones, with the fæces dry and adherent. At their mesenteric attachments the

swelling and exudation were very marked, and noticeable between the coats of the mesentery. Patches of ecchymosis occurred here and there on the peritoneum. The inner surfaces of the stomach and intestines exhibited a condition consistent with the effects of a powerful vesicant on the mucous membrane. In many places there were present inflammation, erosions, and circumscribed swellings, as if from rupture of vesicles. It was now my object to find out what these animals had had to cause their very rapid deaths. The carter, a young man of nineteen, a very stolid specimen of humanity, assisted (?) me in my search; the corn, water, hay, chaff, straw, hay-rick, and pea-haulm rick being carefully examined, without result. A search was also made for any drugs, etc., concealed about the buildings, but nothing found. From previous experience in cases of poisoning, I began to suspect the carter, and begged of him to disclose to me what he had given. At first he was obstinately obdurate, and made the most solemn asseverations of innocence. However, on being promised pardon, he, with much more pressing, confessed he had for four or five days given each horse, rolled up in the hay, a handful of plants obtained from a marshy meadow (intersected by ditches), situated immediately behind the mills. I accompanied him to the meadow, where he pointed out the plant he used—*leaves and roots*. It proved to be the "Ranunculus Flammula." The leaves possessed a hot, acrid taste, and left a numbing sensation, which did not pass off for many hours when a little was put in the mouth. "Because it was 'ot in his mouth," that is why he gave it to his horses, as he thought "it would warm 'em up a bit and maken them look nice." The case recorded excited considerable feeling in this district, and I believe, led to many stringent orders being given to servants not to give nostrums to animals under their care.

RECENT PHYSIOLOGICAL INVESTIGATIONS ON THE ACTION OF SNAKE POISON ON ANIMALS, AND ON THE VALUE OF PERMANGANATE OF POTASSIUM AS AN ANTIDOTE TO ITS EFFECTS.

BY GEORGE GRESSWELL, GRADUATE OF CHRIST CHURCH, OXFORD, AUTHOR OF "THE PLACE OF PHYSICAL SCIENCE IN EDUCATION," ETC.

SOME time ago, when engaged in professorial work near Cape Town, I, together with two colleagues, had occasion to investigate the action of permanganate of potassium as an antidote to the consequences of bites by the venomous snake known in South Africa as the puff-adder. Thinking that the cases might be inte-

resting to the readers of the VETERINARY JOURNAL, herewith I record some particulars. My friend, Mons. Louis Peringuey, who was then lecturer in French, has recently been engaged in important scientific investigations on the Phylloxera. This gentleman, who is also well known for his able contributions to our knowledge of the South African Coleoptera, was very anxious, with me, to give this salt a thorough trial. My friend, Mr. W. Basil Worsfold, the lecturer in Classics, also helped; and he, together with another colleague (Mr. Hillyard), who did a great deal of the work, took the greatest possible interest in watching our proceedings.

A dog, the first subject of our experiments, was bitten at about 12 minutes to 10 o'clock a.m., on a certain day, by a puff-adder four times, every time in a different place. The first three bites were with the same fang, the fourth with the other fang. The first bite was on the nose. The wound bled at once. The second bite, which was not a very successful one, was near the seat of the first. The third was on the shoulder, and the fourth, through the ear, with the other fang (the right), bled a little.

Immediately after the first bite the animal gave utterance to a distinct moan, as though aware of the sad fate to which, in the interests of science, it had been decided to consign him. Let me add here that the dog, though sufficiently strong, in our opinion, to give us a trustworthy train of symptoms, was not in such a condition as to live with very great pleasure to himself. About five minutes after the first bite, the animal's nose began to swell very noticeably. The following notes were taken by M. Peringuey, Mr. Hillyard, and myself:—

At 5 minutes to 10—The dog is getting very reckless and agitated. The nose was swollen to twice its natural size.

At 10 o'clock—The bite on the ear has had no apparent effect—*i.e.*, there is no discernible swelling. A foamy, frothy secretion issues from the nostrils. The dog still takes food.

At 5 minutes past 10—The swelling of the nose increases. The dog becomes somewhat drowsy.

At 10 minutes past 10—The swelling, which is rather hard, has extended from the upper lips as far as the eye; but any marked tumefaction has not made its appearance in the other seats of injury.

At 15 minutes past 10—The dog now refuses food; the swelling increases, especially in the sub-labial region. Breathing through the nose becomes still more difficult; the comatose condition is becoming more extreme. The breathing is very slow (9 in the minute).

At 20 minutes past 10—The swelling is increased. Respirations 9, and laboured, but vary slightly. The swelling shows ecchymoid patches, of a reddish-purple hue.

At 10.25 a.m.—The respirations number 12 per minute, and are laboured. The swelling is still more marked. One hind-leg is stiffened, and apparently partially tetanised.

At 10.29 a.m.—The animal is perfectly helpless, and lies prostrate. The ecchymoid patches are more marked, more purple, and are especially well shown near the teeth. Both hind-legs are slightly stiffened, but movable. The temperature is 99° F.

At 10.35 a.m.—The respirations number 8 per minute. The thermometer stands at $98\frac{30}{5}$ F. The blood oozes out, some of the capillary vessels having burst, as a result of engorgement.

At 10.45 a.m.—The animal is still capable of feeling, since an incision, made to obtain a drop of blood, produces pain, which is evidenced by a scream. The tetanus has disappeared. The dog moves, there being, apparently, a temporary revival. The swelling has extended on to the cranium, and is more marked. Respirations 30 in the minute.

At 11.15 a.m.—An incision was made with some sharpness, for the purpose of procuring a drop of blood for microscopic examination. It is noteworthy that this incision, unlike the one made at 10.45 a.m., was not felt by the dog. A specimen of blood was then carefully prepared with warm water. No abnormal appearances could be detected, except that very slight black dots were seen in the red corpuscles.

At 11.40 a.m.—Respirations 16 per minute. Ecchymosis far more marked; much venous engorgement; eyelids immensely enlarged. The animal is prostrate and quite helpless, complete coma having supervened. The sub-maxillary and other glands appear to be very slightly enlarged, and a little hardened. The swelling is hard and much increased, extending down to the neck.

At 12.20 p.m.—Respirations tranquil, and in number 18 per minute, and in character are equal one to another. Each expiration is followed by a prolonged inspiration, as in sleep. The dog looks as if under the influence of morphia. From time to time, at long intervals, the animal seems a little bit uneasy, and in consequence changes his position, so as to be more comfortably disposed, and then resumes the attitude and appearance of deep sleep.

At 2.15 p.m.—The heart has ceased to beat. The animal is dead.

The *post-mortem* examination was commenced about 3.45 p.m. When the regions in the neighbourhood of the bites were opened out with the scalpels, the most extensive extravasations of bloody serum were seen. All the tissues of the head and neck were immensely engorged with blood. The heart and other organs seemed to be perfectly normal. The right and left ventricles were entirely devoid of blood.

Microscopical examination revealed around the circumferential borders of the red cells several small dark granules. In addition to these peculiarities, there were exhibited a number of very minute rods protruding from the walls of the red-blood cell. These protrusions resembled slightly the appearance presented by the spikes on a horse-chestnut.

In this case no preventive measures were taken, but in the second case the efficacy of permanganate of potassium was tested. A second dog was bitten about a week afterwards by the same puff-adder. In this case the bite was also unmistakable; the bite was, in fact, made with some vehemence.

At 9.50 a.m.—The dog (Ginger) was bitten on the internal aspect of one hind-leg.

At 9.55 a.m.—He was again bitten in the nose.

At 10.15 a.m.—We injected subcutaneously, under the skin of the nose, and in other places, in all about sixty minims of very strong, freshly-made solution of permanganate of potassium.

At 10.30 a.m.—The dog became uneasy, frequently shaking his head and changing his position.

At 10 43 a.m.—No apparent sign of injury.

At 12.15.—The dog is *sleeping* gently, but apparently is not very much out of sorts.

The dog made a complete and permanent recovery. The seat of the bite was marked for several days afterwards by a slight local swelling.

Permanganate of potassium ($KMnO_4$) is, in my opinion, one of the most valuable therapeutic agents we possess. Whatever may be thought of the value of one striking case, such as that above-mentioned, as evidence that the salt has antidotic power in connection with snake-poisoning by the puff-adder, there is abundant evidence from many quarters of its general trustworthiness as a disinfectant. It has been employed as an antidote to the venom of other snakes, but I cannot at this moment specifically refer to the recorded observations. For my part, I feel absolutely certain that an antidote might be found, by extensive and painstaking research, to all kinds of snake-poisoning; and I can only regret that other work of more pressing importance kept my time so much occupied at the Cape, that I could not devote the time and attention to this subject which it so pressingly required. From every point of view, information on this subject would be most valuable, especially now that the whole question of blood-diseases is being re-investigated from an entirely new aspect. Let me abstract from Dr. Bruton's valuable work the following notes:—"Permanganate of potassium very readily parts with its oxygen, and thus destroys organic matter. When mixed with *cobra poison*, it completely destroys its

deadly power. The mixture may be injected subcutaneously without any bad effects. When injected after the poison, however, it does not appear to come into such immediate contact with it in the tissues as to destroy the poison, and therefore the salt does not act as an antidote."

With this last observation the above case does not seem to accord. My opinion is that the antidotic power of the salt would be marked, provided it were injected in sufficient strength and at a sufficiently early period. Firstly, the solution must be very strong, and in sufficient quantity; secondly, it must be injected as near as possible to the seat of injury, as well as in other parts; and, thirdly, in order to be effectual, it must be injected as soon as possible after the bite. It may be mentioned that the salt is used largely as a disinfectant in many ways. In cases of Eczema it is employed to wash the nose, in Mercurial Stomatitis, and in Diphtheria. Externally, also, it is very useful in Gonorrhœa in man.

Mr. J. B. Gresswell tells me he has used it as an injection in bulls with Gonorrhœa with the best results. It has been recommended for internal use in cases of Diabetes.

CASTRATION OF CRYPTORCHID HORSES.

BY C. E. MUNN, VETERINARY SURGEON, WATERTOWN, DAKOTA TERRITORY, U.S.A.

I HAVE been much interested at different times in articles published on this subject in various works on the science of veterinary surgery. There have been several methods described and recommended. I have not as yet, however, seen the so-called Farmer Miles' method published; and, as it is most in vogue in this country with those veterinary practitioners who are successful in performing this operation, it must surely claim the attention of all veterinary surgeons who may be called upon to castrate a cryptorchid horse.

It will not be necessary to enter into any of the preliminaries attending the operation, Mr. L. Nielsen, in his excellent article on this subject, in the January and February numbers of the VETERINARY JOURNAL, having given full particulars as to the proper condition of the animal at the time of the operation, also most desirable age, and so on.

The operator should be very particular in securing the subject to be operated upon. The main points are, to have the animal securely bound, so that there will be as little struggling as possible, the posterior extremities well flexed, the fetlock joints in close proximity to the stifles. Farmer Miles' method of securing, as shown in Fleming's "Operative Surgery," Vol. I., pages 36-40,

is one of the best and safest that I have seen in practice. The subject having been thrown, and properly secured, the operation is performed as follows:—

The parts should be thoroughly cleansed with a warm antiseptic wash, all instruments having been previously disinfected with carbolised oil, or kept within reach of the operator in a basin of carbolised water. The incision should be from 10 to 13 cm. in length, commencing posteriorly, just above the anterior border of the pubis, and a little farther from the median line than is customary in castrating naturally-formed horses. The incision is to be made through the skin only. The fingers of one hand should be inserted beneath the skin, and worked a little to the outside and back, breaking down the subcutaneous tissue until Poupart's ligament is reached. This will be but a short distance. Then the index and median fingers are to be passed over the posterior border of the ligament into the abdominal cavity, care being taken not to injure the ligament or to make the opening into the cavity any larger than necessary. The vicinity of the internal inguinal ring and brim of the pubis can then be explored, and, in most cases, by a careful rotary motion of the fingers, either the gubernaculum testis, the spermatic cord, or the testicle itself can be secured, and the testicle brought to the external opening. If the testicle or either of the guides to it are out of reach of the fingers, the whole hand will have to be inserted. It is very evident, therefore, that the operator with a narrow thin hand has considerable advantage over one whose hand is large and thick. The testicle having been brought to the external opening, I consider that the best method of removing it is by the écraseur, but the instrument must be a good one, that will operate without hemorrhage. Such écraseurs are not common—at least, such has been my experience.

If the operation is properly performed, and the animal well cared for afterwards, there need be but little fear of any bad results. The animal should be kept in a dry, well-ventilated stall, and given small feeds of easily-digested food, and but a small amount of water. There is generally more or less fever for four or five days; after that time, if the animal is doing well, he should be given a little exercise daily, but not until the fever has subsided. The average time for recovery is about three weeks.

Carbolised oil is freely used by some operators on their hands, acting as an antiseptic, and also facilitating and rendering less irritating the passage of the hand from the external opening to the posterior border of Poupart's ligament into the abdominal cavity.

Anæsthetics are hardly ever used in this country during the performance of this operation.

This method of castrating cryptorchid horses has proved very

successful in this country, when skilfully performed. The few deaths that I have known have occurred from Peritonitis, supposed to have been caused through carelessness of the operator in not observing proper antiseptic precautions.

ANTHRAX IN THE DOG.

BY G. F. DAVIS, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, MADRAS.

As I have not seen recorded an instance of Anthrax in the dog, and believe that hitherto it has been considered that carnivora are more or less exempt from this disease, I herewith forward for perusal notes of an outbreak of Anthrax amongst my own dogs, also a case that occurred in another dog that was exposed to contagion in the same way as mine.

On the 22nd January, 1886, a battery horse was reported ill at one o'clock. It had eaten its mid-day feed, and appeared well then (twelve o'clock), but when seen by the Sergeant-Farrier at a quarter-past one was sweating profusely, lying down and evidently suffering some abdominal pain, pulse almost imperceptible, and in a dying condition. Patient died at two o'clock, and as the horse died before I could get to it, I immediately had it removed, and made a *post-mortem* examination, which disclosed the cause of death—Anthrax, of a virulent type. When making the *post-mortem* examination, a bull terrier which was with me, before it could be prevented, I remember licking part of the carcase; also a bull terrier of the Sergeant-Farrier's was with him, and I have no doubt did the same, but in addition the Sergeant-Farrier's dog was suffering from a cut foot, from a piece of glass, and was very lame. I mention this, as possibly inoculation, from walking in the blood, serum, etc., from the carcase, took place.

On the 26th my dog was very ill, coughing; could not swallow well, in a high state of fever, temperature 103° under the thigh, slight running from the nose; and I noticed a peculiar swelling in the submaxillary space, as if the dog had been stung; but the submaxillary glands were swollen, tumefied, and quite hard. The throat was bathed with warm water—milk, soup diet, with bread, given, and quinine pills three a day; but the swelling increased and the distress was very great, so I scarified the swelling deeply, and then noticed the character of the deposit under the skin, the same as in throat cases of Anthrax in the horse—the yellow, gelatinous deposit about an inch and a half in thickness. The dog got worse, the swelling extended down to the chest and over the face, until it more resembled a pig with a very swollen head than a dog, and died on the 28th. I cut into the

swellings, and noticed the characteristic deposit of Anthrax as found in the horse, and occupying the same positions.

On the 27th January, when in the lines, the Farrier-Sergeant asked me to look at his bull-terrier bitch, which he said had a very bad foot. He had poulticed it and soaked it in warm water, but to no purpose, as it got worse; and now the bitch had fever, would not eat, and was very ill. I examined the foot; it was very swollen, a nasty, very large ulcer between the toes; the bitch very dull, muzzle dry, and eyes watering; temperature 104·1°. She died during the night, and I examined her on the morning of the 28th. (Both my dog and this one died on the night of the 28th.) I noticed the submaxillary space filled and the neck very swollen, the swelling extending down to the chest. I cut into the swelling, and here, again, was the characteristic deposit of Anthrax, lighter in colour than in the horse, but of the same consistence, exactly like gelatine. Here, in my opinion, were two undoubted cases of Anthrax, as both dogs were exposed at the same time and died on the same night. One dog might have been inoculated, as it had a cut in the foot, and my dog, as it was always killing bandicoots (a species of large rat), had, no doubt, cuts about his mouth, and was inoculated also. But, to further establish the liability of dogs to the disease, I must mention another case, in my kennel, of the disease. A friend left for England on leave, and handed over to me his two dogs, two bull terriers—Dick and Dodger; the dates I have forgotten when they joined my dogs, but I know that they joined before the death of Buster, the dog that died; as I remember Buster fighting Dick when he arrived, and I had some difficulty in separating them, so it must have been either the 23rd or 24th. Well, Dick was taken ill about a week after Buster's death, exhibiting exactly the same symptoms. He was treated with carbolic acid; I also cut into the swelling in his throat, and dressed it with carbolised oil and hot fomentations, in which I put drops of Acid. carb. in the water; also he had a strong dose of castor oil at outset of the disease, but to no purpose, as he died in two days, the swelling apparently suffocating him, as the deposit was thick under the lining membrane of the larynx. Dodger was taken ill a few days after with cough, and the glands enlarged, but only slight swelling of the throat; temperature 101°. He continued to feed, so I left him alone, and he is now well as ever. I should mention that Dick's temperature was 103·2°, and continued between 103° and 104° until death. The serum of No. 44 battery horse I put under the microscope, and distinctly saw the rods so well illustrated in Pasteur's book; also I sent some of the blood and serum from No. 44 horse and Dick (terrier) to Professor Cheine, Edinburgh, for examination.

TUMOURS NEAR THE POINT OF THE SHOULDER, IN THE LEVATOR HUMERI MUSCLE.

BY C. CUNNINGHAM, M.R.C.V.S., SLATEFORD.

SETTING aside warts, melanotic deposits, callous and fatty-fibrous enlargements under the skin, a word or two on the hard, painful tumours seemingly and really embedded in this muscle. Very troublesome such cases at times are; slight details of a few of different types, as they have occurred in practice during some years, may be of some little use.

(*a*) In student days—a light-brown farm-horse, with an orange-shaped and sized tumour near the inner border of the muscle, very near where butchers and knackers "bleed;" of old standing; nothing done for it, the collar fitted, the horse did his work without inconvenience. We were told that the best anatomical and surgical veterinary professor of his day, on this side the Border (whose name is even yet revered by his old students), in cutting out some such tumour, had the mishap, during a struggle, to injure the carotid; the scene closed, the horse did not rise. For the truth of the story we cannot vouch; but we resolved to give such tumours and the knife, if possible, a wide berth.

(*b*) A Clydesdale mare, in harness, takes fright, bolts, and her gallop ends by the point of the off shaft being driven with force into a stone wall. Next morning, on the off side, under the collar, is a large, round, broad, deep-seated swelling, involving, apparently, the entire thickness of the levator humeri, very hard and very painful. Fomentation, rest, physic, time, and a mild blister dissipate the enlargement; in six weeks or so there is no trace of it. It does not return. A pleasant, but rather rare, ending.

(*c*) A black horse has been working in the quarries, and in the muscle of the off side a tumour, very like a large lemon, but very hard, has formed; of ten days or a fortnight's standing, distinct from the skin embedded in the muscle, circumscribed, not embracing its whole breadth or thickness. A good, firm blister, and the tumour becomes almost an abscess; is lanced. A second free incision into its remaining hard substance brings about healthy action; it disappears. A rather short collar, tightly fitting the sides of the neck, and "chambered," prevents recurrence.

(*d*) A big brown farm-horse has been ploughing in hard ground with occasional stones cropping up; and under the collar, also on the off side, during the week, a large, round, hard, but slightly elastic swelling has made its appearance, extending deeply into the substance of the muscle, and very sore. A few days' fomentation, a good blister, and the tumour bursts, decreases somewhat in

size, and then remains stationary, showing even slight signs of re enlarging. A careful examination for the cause of this state of matters detects a small opening in the centre of the tumour, through which a probe or pencil can be made to pass, and, forcing a passage, the finger goes right through the muscle itself, and finds another and a smaller abscess on its other side.

A probe-pointed bistoury enlarges the passage made by the finger; a good gutter is made between the inner and outer abscesses, free drainage given; the tumour speedily disappears, keeps away; the horse works for several years on the farm, and gives no further trouble.

(*e*) A dark-brown cart-horse, with a large, hard, conical tumour standing out like a big breast from the front of the shoulder, and, as if to make the analogy complete, a small opening like a nipple in its centre. This opening is enlarged, filled with the old "Quittor" mixture, corrosive sublimate and flour, and a slough got out. But the tumour is an old one, and soon recovers; it is very hard, its root broad and firm, spreading deeply into the muscular tissue; and the horse is troublesome and will stand no nonsense. The case is shown to two veterinary friends, and, as a result, taken to the Veterinary Institution and cast; and there, with every care and the best skill available, "excision" is most carefully and skilfully performed. The hemorrhage is of no great account; the tumour has a whitish-yellow, fibrous, callous appearance, and so has the muscle from which it has been cut and scooped out. The wound heals in five or six weeks, but not very satisfactorily. There seems to be too much "skin" left; there is something hard yet in the muscle which shouldn't be there, and after a few days' work up rises the tumour half as big as before. The horse is exchanged for another, and passes from observation.

(*f*) Some months after, from the same stable comes a white horse, and the tumour on his neck is the largest, up to that time, seen by us; very broad, hot, hard, and painful, with the slightly elastic feel most such tumours have; its best treatment is a problem. Not of very long standing; excision would be a serious matter; resolution not likely to take place. A good, firm cantharidine blister, and the horse comes back in ten days with the tumour but little changed. Another blister, and in a week it bursts; a tiny hole, well up the neck, at the upper edge of the muscle, and through it a probe passes at once and deeply into an abscess on its other side, and suspiciously in the direction of the carotid and jugular. For this reason a seton is not greatly thought of; the "fistulous-withers" treatment seems preferable. The horse's head is pulled up to a ring in the wall, a twitch well put on, the off foreleg tied up, and inserting a good, strong, probe-pointed bistoury into

the opening, by big cuts and saw-like action the gristly mass is laid open from top to bottom. An ugly gash, eight or nine inches long, and through walls, from ½ inch to 1⅛ inch in thickness. The hemorrhage is considerable, but by no means alarming. Three or four arteries are spouting away, but they are but small ones. A touch of the firing-iron to their mouths, and a few deep cross-stitches improve the look of matters, and we watch the result. Somewhat to our surprise, and considerably to our gratification, the case becomes a simple wound. Free and profuse suppuration sets in, the gristly walls subside and coalesce. In six weeks or so the tumour has disappeared, the wound healed, and in course of time where there was a tumour there is a depression and slight atrophy; the muscle looks as if it had been cut through and united again. The horse works at hard work for two or three years, gives no further trouble, but carries the mark of the big cut and cross-stitches among his white hair to the grave with him.

(*g*) A brown mare, of quick temper, bounding at her work, a little subject to swellings of the shoulders, and with now two tumours, not unlike large magnum-bonum potatoes, one in each levator humeri. Both are blistered, the off—the larger—decreases in size and disappears; the near and smaller enlarges, remains stationary and resists all blistering. Not relishing excision, a needle is thrust well into the centre of the tumour, partly withdrawn, a shallower hold taken, and a seton inserted. Good effect; free suppuration, chiefly from the first thrust. Another and a deeper seton did away with the remains of the tumour. The mare had a collar specially made for her; she is working now, and has been for two or three years. Occasionally, some slight indications of the former seat of the tumours show, from the mare's quick way of working, but nothing of consequence. She has not been touched since.

(*h*) A farm-horse, with two fair-sized tumours on the near side—one above, the other a few inches below, the point of the shoulder; both in the levator humeri; of six months' standing. The tumours are blistered, and they get less, and the upper one bursts; and we enlarged the opening, but not thoroughly, and told the owner that the enlargements would require to be setoned and perhaps cut out. No great partiality for the operation on either side, seeing about six inches of the muscle is involved, and the horse is taken to the home farm "to be taken care of"; sold, and remains "much the same."

(*i* and *j*) Severe cases.

(*i*) (January–March, 1884.)—A darkish-grey entire horse, twelve years or so, good shape, strongly-built, compact. Been operated on before, we are told, and now a big tumour, like a

sensational "Show" turnip, on the off side of the neck and shoulder. On the skin, where the collar lies, and up among the hairs of the mane, numerous other little swellings. Legs, below hocks and knees, round and coarse, and at the back of each hind pastern, under the skin, a couple of tumours like small apples. Despite his well-made frame, the horse's constitution and the state of his system is evidently such that, on very little provocation, and almost with no provocation at all, tumours largely composed of condensed cellular tissue and a low form of fibro-cartilage are very apt to grow and form, and, notably on the neck and legs, have formed and grown. In the current favoured, jaw-exercising language of the day, may we say the horse has a subcutaneous, fibromatous, enchondromatous diathesis?

Glancing at the tumours, big and small, we shied out of the case, wished to have nothing to do with it; but in a few months the horse was brought to be killed or cured, useless for work.

The tumour consists of two parts. A central, globular portion, about six inches in diameter, excessively hard, with a smooth, polished feel, firmly embedded in the muscle, covered and surrounded externally by a softer, fatty-fibrous feeling mass, about two inches in thickness, which extends across the median line in front of the neck, and spreads out and beyond the point of the shoulder. On the surface of the skin are about half a dozen openings of small sinuses leading into little abscesses in both hard and soft portions.

We did not see our way to cast and perform a heroic operation, but we tried to destroy the tumour by any available means. A seton through its substance causes, apparently, no pain save the snipping of the skin, but has little effect. A dead mass saturated with arsenic or corrosive sublimate is not pleasant to handle; an old friend, sulphur, into a stiff paste, with sulphuric acid, is preferred. Smearing the seton with this, in a few days a good-sized hole drilled through the tumour; plugging the lower opening and filling the space with the paste, in a few more a slough six by three inches, and eating well into the mass. Another application and a paring-away of the destroyed substance makes the tumour less, but the process is slow. The knife is tried as the horse stands, but he won't have it, and a good deal of blood comes. A hot, sharp firing-iron, and, to our surprise, the horse does not stir; so long as we keep off the skin, we may fire as deeply and as long as we please; and by acid, knife, and firing-iron, in the course of a week or two the big mass is brought about level with the skin, and at parts well into the muscle. But it begins to grow again.

A friend gives very material assistance, and supplies the right principle, when he says the excision is not deep, not thorough

enough. Deep in the muscle there is a very hard, but not very big, saucer-shaped mass left, the evident cause of all the mischief. At next dressing a firing-iron is sent through its centre, dividing it. A piece of string, with a needle through each half, and in turn pulling at each with an iron which has become flat on one side and convex on the other, we went round the circumference and deep into the muscle, and scooped out all the remaining diseased mass—not unlike a tinker soldering. Very near the large blood-vessels, with considerable trepidation. When the horse's head is pushed up, where there was a tumour there is now a biggish hole. If the throat is not cut, it is not far off it; but the finish seems satisfactory. There is no hardness now, all is soft. No hemorrhage—the surface is a nice rich-brown colour, like the strokes of a well-fired leg. A common wound the big sore became, took time to heal, but it healed; the muscle of the off side became as soft, and had as natural a feeling, as that of the near. On the horse's rough thick skin there was little mark left; one would scarcely believe such a tumour had once been there.

(*j*) Last, and worst (October, 1885).—A big black English mare, seven years old, with an enlargement or tumour extending from four inches above the point of the shoulder down to the brachial (weed) glands, and even a little between the legs, not less than eighteen inches long, a foot broad, standing out five inches from the level of the breast; not hot, nor very painful, but callous-looking; firmly bound to and blended with the muscles and tissues, and hard as it well can be—the most unnatural and formidable external tumour of our acquaintance.

In February and March this mare had been off work from a quittor in the off hind-foot—cured. In front of same pastern a greasy, fibrous excrescence, which a couple of firm applications of the firing-iron did away with; in the off levator humeri a small tumour, not large, rather pendulous and flabby; would not, apparently, be difficult to cut out, but its roots had a very deep-seated attachment to the muscle, both above and below the point of the shoulder. Two or three very small fistulous openings on its surface.

Pus formed in the tumour; exit was given, the opening enlarged, the little sinuses laid freely open, the greater part of the mass brought away as a slough; but, instead of getting less, the tumour got larger—the means which answered well in other cases seemed useless, if not hurtful, here. We put it to the owners, either to cast the mare, and cut out *every vestige* of the tumour—a difficult and doubtful operation—or to "chamber" the collar, and try her on the farm for a little. The latter course was taken, and the result, the first time the mare was on the road, was the "Cruelties"—the County Court—£2.

Following in the dismal chapter of incidents, the animal was no sooner put in the stable than a boy sent a sharp fork right into the side of the off fore-pastern ; out came the synovia, and for weeks the mare hung a wreck in slings. The foot at last showed signs of recovery with time, and to wait the result—and "out of sight, out of mind," for the summer months—the mare was "floated" seven miles to the farm ; and now (in October) she is sound, but for this huge mass in front of the shoulder.

The mare was cast, put under and kept well under chloroform, and a so-called operation attempted, and from the first cut to the last *the* feature was hæmorrhage. No bloodless fibro-cartilaginous mass. Tough and hard, and ill to cut, the tumour certainly is ; but it is traversed by blood-vessels of more than ordinary number and calibre. Now a small artery, then a biggish vein, and at times a large nutrient artery hissing two or three feet into the air ; but for one and all the divided vessels we had only one effectual (and it appeared to us the only practicable) styptic—a hot, smooth firing-iron. However large the blood-vessel, a good soldering rub—(the mare being insensible)—stopped the bleeding, somewhat to our surprise. After-examination showed the tumour to be fibro-elastic in texture ; in its centre one, at least, very large nutrient artery, and from the excised mass, branches of this vessel, of very considerable size, could easily be dissected. At parts the veins were enlarged and varicose, approaching somewhat to the size of a small jugular. The efficacy of the hot iron is accounted for by the fact that on its application the vessels would contract and recede, while the surrounding fibro-elastic material would form about the best possible medium for constringing, closing, and forming an impenetrable scar over them.

To remove the entire mass seemed impracticable. We tried to exterminate and remove only the central hard portion, leaving the outer, softer parts to another occasion. We divided the tumour through the centre, took out three successive saucer-shaped layers, weighing together five or six pounds—very light for their size—went right through the muscle, till something not unlike the capsule of a joint or a large vein showed on the other side. We "bottomed" the tumour, took out its hard centre, better it seemed to us than with the grey entire horse (*i*) ; but a like good result did not follow.

For weeks we tried all we could ; considerable improvement took place for a time, but latterly the swelling at the lower part got harder and bigger, deep sinuses and small bursting abcesses showed through its whole extent, and, recovery being deemed hopeless, the mare was destroyed.

Post-mortem Examination.—Internal organs healthy—no appa-

rent signs of Tubercle, Lymphadenoma, or Cancer. The upper part of the levator humeri normal—a red, fleshy muscle. Two or three inches from the tumour, fibres dark-coloured, softer, more flabby —decreased in size, even in number; and between the bundles of fibres a slight deposit of dingey, yellowish, soft, fatty matter—atrophy and fatty infiltration. At the circumference of the tumour, the effects of inflammatory action,—fibres red, almost scarlet, jelly-like glaze on them, compressed together, and the bundles separated from each other by a yellowish-white consolidated exudate; while the red cut ends of the bundles, showing, on a cross section, in the light-coloured exudation, give the muscle the appearance of a Pleuro-pneumonia Epizoötica lung. At a yard's distance it is difficult to distinguish between the two. We see no reason why the term "hepatization" should not be applied here, in both its red and grey forms.

A little further in the tumour all trace of the muscular fibres has disappeared—save a pale shred here and there, there is none. The fibres have become absorbed or undergone metamorphosis—nothing remains but the exudate as a consolidated deposit, which varies in different parts of the tumour, apparently, with its stage of development. In parts, notably those from which the tumour was removed, and which have filled up again, the structure is nothing more than cellular tissue, condensed, and pressed, and woven together into a compact mass—what, we presume, may be termed fibroma. At other parts we have the usual fibrous or low fibro-cartilaginous structure—enchondroma, or an approach to it. Selecting the harder portions of this, we find at one part, in the centre, a small oval or rounded darker-coloured patch of a dingey yellow colour. A little further on we find these patches softening into pus—here is an imprisoned or encysted abscess, there small, and at places large, abscesses discharging by sinuous canals on the surface. One deep sinus, at the superior part of the tumour, leads right through into a small abscess in the anterior deep pectoral muscle. Two or three other large sinuses, at the lower part, extend in a sloping direction for four or five inches into the substance of the mass. Above the superficial pectoral muscles in the region of the brachial glands, is a firm, hard, consolidated mass, and in its centre a considerable abscess. The outer attachment of the posterior deep pectoral to the head of the humerus, as also a large portion of the outer part of the superficial muscles is involved, showing very considerable atrophy and fatty degeneration.

Of the inferior extremity of the levator humeri, save a few outer fibres of attachment, there is scarcely a trace; its lower third and the sternal part of the panniculus have gone, fused and converted into a huge, enchondromatous, suppurating mass, spread-

ing into the pectoral muscles and other structures—leaving its mark on the flexor brachii, showing even on the humeralis externus. Slowly we comprehend that for weeks we have been working at an impossibility, trying to cure what we could not cure. Slowly we see that, though a *thorough* operation might, perhaps, have succeeded at first, yet at such a late date surgical treatment was foolish and wrong. Slowly we are driven to the conclusion that we have made a fairly big and serious miscalculation, to put it mildly, and we pen these lines that others may take note and warning.

Remarks.—A few in next or some future number.

CASE OF BULLET WOUND.

BY G. R. GRIFFITH, M.R.C.V.S., A.V.D., CAIRO, EGYPT.

THE following case, I think, is of sufficient interest to record as an instance of a bullet wound and the lodgment of the bullet in the structures of the foot.

On making my monthly inspection at Alexandria, in January, 1886, a native (Syrian) horse, age eight years, belonging to the mounted orderlies, was reported to me for lameness in both fore-feet, with the statement that the lameness had been observed for some time, but that latterly it had increased. On examination, I found the horse very lame on both fore feet, with all the symptoms of chronic Laminitis, the animal going on the heels, and there being the usual irregular growth of the horn, showing disturbance of the secretory process. The ordinary treatment was had recourse to.

On my next inspection, in February, I found no improvement in the case, and considering the horse unfit for further military service, it was eventually destroyed on the 11th March, 1886, by order of the General commanding, the latter having an objection, on the score of humanity, to its disposal, as is usual, by sale. I may add that this horse had been, since 1882, with the mounted orderlies, which entailed daily work, at a trot, on the stone pavement of Alexandria; for this reason I was a little curious to ascertain the state of the navicular bones, and therefore made an autopsy of the same.

On making a vertical section on the inner side, from below upwards, inclined to the median line, of the off fore-foot, and having reached the upper third of the os pedis, a bullet was found firmly lodged between the outer surface of that bone and the horny laminæ in front. On further examination, I found a small and old cicatrix on the skin over the inner side and lower third of the os

suffraginis, no other lesion of the skin being apparent, the bullet, evidently a spent one, having struck the animal at this spot, and taken a downward and forward course underneath the skin.

In conclusion, I may add that this horse served in the ranks of the mounted infantry during the Egyptian campaign of 1882, when, no doubt, it was wounded as described.

The hoof, with bullet, which I forward, will show that the horn-secreting process has not been interfered with as a consequence of this injury, there only being that condition of horn frequently seen in cases of Laminitis, and, moreover, that no ill results seemed to have supervened owing to the presence of the bullet within the hoof. It is remarkable that the animal should have been able to perform its duties, for a period of about three years, with a bullet lodged, as described, in the structures of the foot. To me it seems curious that the bullet, having struck the limb as above described, should not have lacerated the skin in its downward course, but have seemingly kept below that structure, and I can only surmise that the hoof must have been off the ground, and in a flexed position at the time.

AN ATTACK OF RABIES IN SHEEP.

BY GRESSWELL AND GIBBINGS, M.R.C.V.S., NOTTINGHAM.

A FEW weeks ago we were asked to see some sheep which had been bitten by a dog supposed to be affected with Rabies.

As the dog had been shot previous to our arrival, we were enabled to make a *post-mortem* examination. We found, however, no decided evidence of Rabies. The larynx and stomach were certainly slightly congested, and in the latter *nothing*, except such foreign substances as grass and earth, was found. Insufficient, however, as this evidence was, we strongly suspected Rabies, from the history of the case. The dog, a stranger in the neighbourhood, visited three farms in a semicircle, bit one ewe and lamb on the first farm, several on the second, and several more on the third. Altogether about twenty sheep were bitten. The bites were short, sharp snaps, judging from the appearance of the wounds. The dog seemed to have no sooner bitten one than he left it and attacked another, evidently having tried to bite as many as he could, and he had invariably made the face the point of attack.

Now, in the first place, the dog could not have been healthy; otherwise, instead of worrying and biting several sheep on the face alone, we presumed he would have killed a single lamb, and thus satisfied the pangs of hunger.

Again, having regard to the fact that the horn of the toes was considerably worn, we inferred that the dog had travelled some distance, presumably as a result of the rabid state.

In the third place, being a small terrier, he could not have been accustomed to worry sheep, as he would, in all probability, have been killed long ago.

On the whole, therefore, we concluded that it was a case of Rabies, and our diagnosis was proved to be correct by the fact that, on the fourteenth and fifteenth and sixteenth days after being attacked, the sheep (ewes and lambs) were in some cases affected with Rabies.

More exactly, the facts were as follows:—Two flocks had been bitten on two successive days. Fourteen days after the first flock was attacked, one ewe became restless—she ate nothing, she also constantly ran after the others and butted at them. At first sight she appeared to be under the influence of great sexual excitement, but the continued and determined manner in which she charged at every sheep in turn, and the short attacks (in point of time) she made at each one, indicated clearly some brain affection. She was isolated, whereupon all these symptoms disappeared, and only a dull, obstinate lethargy supervened. Upon putting her back amongst the others, she pursued the same tactics. These symptoms lasted two days. On the third day tetanic spasms came on, with frothing at the mouth, intermittent inversion of the eyeballs, and occasional severe rigidity of the whole muscular system.

On the fourth day she was destroyed. Another ewe became similarly affected on the fifteenth day, and two more and several lambs on the sixteenth. In all, out of the first flock, six ewes and four lambs were bitten, and five ewes and all the lambs died or were killed.

In all cases, out of the first flock, the affected sheep showed symptoms similar to those of the first; but in the majority the tetanic convulsions appeared sooner, in most cases on the second day. In the second flock, twelve ewes and lambs were bitten; of these one ewe and two lambs died on the third day, but not with any symptoms of Rabies that were noticeable. These three deaths were attributed to the extensive lacerations of the head they had sustained.

One ewe was affected with Rabies on the fifteenth day, and only a second case occurred, which was on the sixteenth day. The peculiar immunity this second flock showed from Rabies was remarkable. The two flocks were distant a mile and a half. The first was attacked late in the afternoon, and the second evidently very early on the next morning, as they were found at six a.m. in a distressed and frightened condition, the dog being only half a mile away. It may have been possible that the second flock was not inoculated with virus of sufficient quality or quantity to have been effectual in causing Rabies, or the first flock may have exhausted the supply.

AN EXPLANATION OF THE CONDITIONS WHICH BRING ABOUT A NARROW OR WIDE CHEST IN HORSES.

BY FRED SMITH, ARMY VETERINARY SURGEON.

I HAVE often felt puzzled to know what conditions existed to account for the extreme difference in appearance of a narrow and wide-chested horse. Was it due to muscular development, or was it that the thorax was really wider in the one case than in the other? With the object of determining the point, I selected four horses: two had extremely narrow chests, "both legs coming out of the same hole," as the horseman expresses it; the other two had remarkably full and wide chests. I paired them according to height, made careful measurements of the shoulders and chests, then destroyed the horses, removed and weighed all the shoulder and chest muscles carefully, and, lastly, took the transverse diameter of the thorax at its widest part, from the first to the eighth rib. I will call the two first horses A and B. A had a fine wide chest, B a particularly narrow one. Both horses were the same height.

Measurements.

	A. (The horse with the wide chest.)	B. (The horse with the narrow chest.)	Difference in favour of A.
From the outside of one shoulder to the outside of the other ...	15¾ inches.	14¾ inches.	1 inch.
Width between the inside of both shoulders	5¾ „	4 „	1¾ „
Width from the outside of one elbow-joint to the outside of the other	14¾ „	10 „	4¾ „
Width between the arms ...	7¼ „	5 „	2¼ „

Both horses were now destroyed, and the muscles covering these regions removed and weighed:—

	A.	B.
Pectoralis trans. ...	3 lbs. 1 oz.	2 lbs. 2 oz. 15 oz.
„ anticus ...	3 „ 0 „	2 „ 3 „ 13 „
„ magnus ...	5 „ 8 „	3 „ 7 „ 2 lbs. 1 „
Antea spinatus	2 „ 3 „	1 „ 11 „ 8 „
Postea „	2 „ 11 „	2 „ 10 „ 1 „
Flexor brachii	1 „ 11 „	1 „ 7 „ 4 „
Subscapularis	1 „ 8 „	1 „ 5 „ 3 „
Teres internus	1 „ 2 „	13 „ 5 „
Triceps ext. brach. ...	9 „ 0 „	7 „ 10 „ 1 „ 6 „
Humeralis ext.	1 „ 1 „	14 „ 3 „

The whole of the muscles were now removed from the ribs, and nothing but the frame of the thorax left. Measurements were instituted across the thorax, from rib to rib, with the following results:—

Rib.		A.		B.	Difference in favour of A.
1st.	Distance apart...	$3\frac{3}{4}$ inches.	...	$3\frac{1}{2}$ inches	... $+\frac{1}{4}$ inch.
2nd.	„ „ ...	$4\frac{1}{2}$ „	...	$4\frac{3}{4}$ „	... $-\frac{1}{4}$ „
3rd.	„ „ ...	6 „	...	$6\frac{1}{8}$ „	... $-\frac{1}{8}$ „
4th.	„ „ ...	$7\frac{1}{2}$ „	...	$7\frac{1}{2}$ „	... $+\frac{1}{4}$ „
5th.	„ „ ...	$9\frac{1}{4}$ „	...	$8\frac{1}{2}$ „	... +1 „
6th.	„ „ ...	$11\frac{3}{4}$ „	...	11 „	... $+\frac{3}{8}$ „
7th.	„ „ ...	14 „	...	13 „	... +1 „
8th.	„ „ ...	$16\frac{1}{2}$ „	...	$15\frac{1}{2}$ „	... +1 „

Remarks.—The results of these observations are, to my mind, most instructive. On looking at the measurements of the shoulders, elbows, etc., we observe no very great difference in the width of the part until we come opposite to the elbow-joints, and here we find a difference of $4\frac{3}{4}$ inches between the narrow and wide-chested horse. This great difference in width would correspond with the increase in the weight of the pectoral and triceps muscles, which, we see from the table, are much larger in the wide than narrow-chested horse. The measurements of the thorax are most important. Here we actually find that the horse with the narrow chest is slightly wider opposite to the second and third ribs than his fellow, and the latter has but a very slight advantage until we come to the seventh and eighth ribs. We are, therefore, clearly shown that the extreme difference in the width of these horses' chests *did not depend upon an actually larger thorax, but on the muscular development of the part.*

To test the correctness of this view, the experiment was repeated on two more horses, C and D, both of one height, C having a wide, D a narrow chest.

Measurements.

	C.	D.	Difference in favour of C.
From the centre of the spine of one one scapula to that of the other ...	14 inches.	$12\frac{1}{4}$ inches.	$1\frac{3}{4}$ inches.
From the outside of one shoulder to that of the other	$14\frac{1}{2}$ „	$13\frac{1}{4}$ „	$1\frac{1}{4}$ „
From the hollow above the front of the elbow-joint to the same on the opposite limb	13 „	$8\frac{1}{2}$ „	$4\frac{1}{2}$ „
From the outside of one arm to the outside of the other	$13\frac{1}{2}$ „	$11\frac{1}{2}$ „	2 „
From the edge of the sternum to the inside of arm	$4\frac{1}{2}$ „	$2\frac{1}{2}$ „	$1\frac{3}{4}$ „
Width between the upper part of arms (inside)	6 „	$4\frac{1}{4}$ „	$1\frac{3}{4}$ „
Ditto, centre of arms (inside)... ...	7 „	$4\frac{3}{4}$ „	$2\frac{1}{4}$ „
Width between the knees (inside) ...	6 „	$3\frac{1}{2}$ „	$2\frac{1}{2}$ „
Depth of girth	26 „	$24\frac{1}{2}$ „	$1\frac{1}{2}$ „

Both horses were destroyed, and the following are the weights of their muscles :—

	C.	D.	Difference in favour of C.
Pectoralis trans.	2 lbs. 5 oz.	2 lbs. 1 oz.	+ 4 oz.
„ anticus	3 „ 5½ „	2 „ 2 „	+1 lb. 3½ „
„ magnus	3 „ 8 „	3 „ 9 „	− 1 „
Serratus „	6 „ 6 „	5 „ 5 „	+1 „ 1 „
Flexor brachii	1 „ 4 „	1 „ 7 „	− 3 „
Levator humeri	2 „ 0 „	2 „ 0 „	
Lat. dorsi	3 „ 12 „	2 „ 9 „	+1 „ 3 „
Trapezius	1 „ 10 „	1 „ 8 „	+ 2 „
Triceps ext. brach.	7 „ 14 „	6 „ 12 „	+1 „ 2 „
Subscapularis and teres ...	2 „ 3 „	1 „ 10 „	+ 9 „
Antea spinatus	1 „ 9 „	1 „ 2 „	+ 7 „
Postea „	2 „ 6 „	3 „ 1 „	− 11 „
Humeralis ext.	12 „	1 „ 0 „	− 4 „
Muscles' clothing front of arm	1 „ 12 „	1 „ 10 „	+ 2 „
Muscles' clothing back of arm	2 „ 4 „	2 „ 1 „	+ 3 „

Measurements of Transverse Diameter of Chest.

Rib.	C.	D.	Difference in favour of C.
1st. Distance apart ...	3½ inches. ...	3 inches. ...	½ inch.
2nd. „ „ ...	4½ „ ...	4½ „ ...	¼ „
3rd. „ „ ...	6¼ „ ...	5¾ „ ...	¼ „
4th. „ „ ...	7½ „ ...	7¼ „ ...	¼ „
5th. „ „ ...	9 „ ...	9 „ ...	
6th. „ „ ...	11 „ ...	11 „ ...	
7th. „ „ ...	14 „ ...	13½ „ ...	½ „
8th. „ „ ...	16½ „ ...	16 „ ...	½ „
9th. „ „ ...	18½ „ ...	17 „ ...	1½ „
10th. „ „ ...	20 „ ...	18 „ ...	2 „
Depth from vertebra to enciform cartilage ...	17¼ „ ...	16½ „ ...	¾ „

Remarks.—It will be observed that in the measurements the horse with the wide chest is all over larger, the greatest difference being, as before, at the elbows; at the shoulders the difference was slight—in fact, the least recorded; it is singular, therefore, that in the one bone, the humerus, both the greatest and the least difference in measurement between these horses should be found!

In observing the weights of the muscles, we find the pectoral, serratus, latissimus, and triceps, and all muscles, considerably larger in the wide than in the narrow-chested horse. There are four muscles in horse D larger than in C, but they are of no importance. The wide-chested horse had 6¼ lbs. more muscle on his chest and shoulders than had his fellow with the narrow chest.

The difference in the transverse diameter of the thorax is very slight; for the fifth and sixth ribs there is no difference, and it is very unimportant for the others—not by any means sufficient to account for the great differences in the size of their chests.

These observations show that a wide chest does not depend upon a wide thorax, but rests entirely with the muscular development of the part; the muscles are those situated on the side of the sternum and ribs, and surrounding the humerus.

From this we are wrong in considering that a narrow-chested horse has decreased lung capacity.

Editorial.

SWINE PLAGUE.

This veritable scourge of the porcine tribe shows little evidence of diminishing its ravages in those countries in which it has been allowed to establish itself; and perhaps it would not be an excess of imprudence to predict that, unless more successful measures are introduced than have hitherto been devised, the swine population of these countries stands a good chance of being exterminated by it, and at no very distant day. This prediction would have for its basis the inefficacy of the measures hitherto invoked for the suppression, or, at any rate, limitation, of the disease, its extreme infectiousness, and the very heavy mortality it causes. The loss incurred by it in those countries in which it is most prevalent—as the United States—is very great, and compromises to a considerable degree the success of pig-breeding and rearing, together with the other branches of trade dependent thereon. As to the modes in which the infection is conveyed, these are numerous—indeed, the malady, for infectiousness, may be aptly compared to the Cattle Plague; though, for several reasons, it is more difficult to deal with, because of the way in which pigs are kept, their location, and the manner in which the traffic in them is conducted. The latter is, however, perhaps the most important factor in the dissemination of the germs of Swine Plague; and in all likelihood it would be found, if inquiry were carefully made, that a most prolific instrument in this distribution of the disorder is the pig-dealer's cart, which, it appears, can evade all laws and regulations with regard to cleansing and disinfection, and is employed in the conveyance of, let us hope, healthy pigs generally, diseased ones only occasionally—their condition being, of course, unknown to the dealer. Knowing the terribly infectious nature of the disease, it can be readily understood how the contaminated cart can become a most active propagator, and yet escape sanitary control. One load of diseased pigs, carried for only a short distance, will make this cart a focus of infection to healthy pigs carried in it, for months afterwards.

All evidence goes to prove that the appearance of Swine Plague—its existence, in fact, depends upon its infecting principle (the special microbes or germs), and that its "spontaneous" origin is beyond the influence or power of all the other causes which have been enumerated as tending to such development. From the researches of Pasteur and his assistants, as well as Cornevin, in France—and also of our skilled colleague, Dr. Detmers, in the United States—it seems to be demonstrated beyond doubt that this microbe is a micrococcus, joined in couples to form a figure of eight, or sometimes in groups of four; it is not a bacterium, as asserted by Klein. The latter also stated that the disease could not be transmitted to pigeons by inoculation; but the above-mentioned authorities have experienced no difficulty in doing so—indeed the experiments of Dr. Salmon, in America, with the virus of the disease, have been to a large extent carried out on these birds.

The nature of the malady is becoming better known, thanks to the investigations made on the Continent and in America; we may, in particular, mention those contained in the excellent monograph by Cornevin on "Le Rouget," as the disease is termed in France.

If it is found that Swine Plague cannot be stamped-out by sanitary police measures—which, we are of opinion, it should—then, to prevent such heavy losses, it might be advisable to have recourse to protective inoculation, as devised by Pasteur, and so satisfactorily demonstrated to be efficacious by recent experiments in France and in the Grand Duchy of Baden. Pasteur attenuates the virus by cultivating the microbe, but Salmon seems to have arrived at the same result by the simpler and less tedious process of exposing it to a certain temperature for a short time.

ON PLETHORA.*

BY PROFESSOR DR. O. BOLLINGER, MUNICH PATHOLOGICAL INSTITUTE.

IN no branch of medicine does the intimate relationship of theory and practice become so apparent as in the pathology of the blood. In days, fortunately for us, gone by, when humour pathology held the sceptre of medicine, and bleeding was considered absolutely necessary for all prophylactic and therapeutic treatment, the belief in true plethora was quite a dogma.

Through the studies of Oertel, the question of circulatory disturbances has entered a new phase, and therapeutically, by means of delicate physiological demonstrations, the question has also acquired fresh foundation.

It has long been known to physiologists and pathologists, that the blood quantity in man and animals is liable to great variation, both in a normal and pathological state; but these changes are kept within certain limits, both qualitative and quantitative, by the absorption of food and drink on one hand, and on the other by muscular activity, the action of the heart, and certain excretory operations, such as urination and perspiration.

How promptly this system of compensation works in a healthy organism can easily be demonstrated by moderate phlebotomy, by which it can be proved that this artificial depletion is soon remedied, without any striking disturbance in the health of the patient.

Until recently, the existence of true plethora was accepted by most clinics and pathological anatomists, although with a certain amount of reserve; but lately fresh experiments in Ludwig's laboratory in Leipzig have caused the discussion to be reopened, and Cohnheim has taken a very decided position, and attacked the doctrine of true polyæmia with some success.

Cohnheim demonstrated by experiment on animals, that it is impossible to produce a lasting plethora by artificial transfusion of blood. He found that by adding 50 per cent. to 80 per cent. to the blood-quantity only a passing disturbance was produced, without any increase in arterial pressure. From these investigations he was led to deny that any lasting increase in the volume of the blood can occur pathologically. He asserts that neither excessive feeding nor want of exercise will cause plethora; they only increase fatty deposits. So-called plethoric symptoms he explained by enervation of the circulatory system. He adds, "Everything, practically speaking, fails to give scientific proof of plethora."

* Summary of an address to the Surgical Society at Munich, on 27th January, 1886. Translated by F. Raymond, F.R.C.V.S., A.V.D.

Dr. Bollinger continues: Cohnheim asserts that because a permanent plethora cannot be produced artificially, a really true polyæmia is at the utmost a passing incident, but he has completely overlooked the fact that the development of these chronic irregularities is quite gradual, generally occupying many months or years, and further, that in any case the settlement of so important and difficult a question by a few negative experimental results is inadmissible.

On the other hand, Von Recklinghausen, in his recent "General Pathological Handbook," appears as an advocate of the existence of true plethora. He acknowledges the want of precise data in support of plethora vera, but takes his standpoint on clinical and anatomical experience, which supports his views.

Plethoric individuals have a full, large, often a dilated pulse, and a pronounced tendency to congestion; their skin and visible mucous membranes are hyperæmic; they have also a considerable liability to hæmorrhage from increased blood pressure, particularly in the brain and lungs.

In this class of persons, great sanguineousness, hypertrophy and dilation of the heart, of the great vessels, and also of the capillaries of the principal glands, are noticed.

The enlargement and dilation of the heart is explained by increased demand upon its powers.

Even when the blood hypertrophy is met by cardiac hypertrophy, the circulatory system is still in a state of abnormal tension.

Febrile and inflammatory processes are replete with danger to such individuals, and may account for many rapidly occurring deaths.

Panum, by reliable experiments has demonstrated that in death from hæmorrhage exactly one-third of the entire blood volume remains in the body.

Starting from this point, Dr. Ludwig Heissler, of Eichstädt, experimented upon eighty-four animals, viz., twelve pigs, fourteen oxen, twenty sheep, and thirty-eight horses, with the following results:—

Animal.	Average percentage of Blood.	Proportion to Weight of Carcase.	Minimum.	Maximum.	Difference.
			Per cent.	Per cent.	Per cent.
Pig	4·60	1·22	2·25	8·70	6·45
Cattle..	7·71	1·13	6·03	10·00	3·97
Sheep..	8·10	1·12	6·56	10·43	3·87
Horses	9·75	1·10	5·90	13·5	7·60
Dogs ..	8·46	1·11	4·40	12·4	8·00

Heissler draws the following conclusions:—

The strikingly small quantity of blood in pigs verges upon a pathological state, and is undoubtedly connected with the considerable adipose deposit found in fattened animals. It appears that the percentage of blood is in inverse ratio to that of the fat. The pig with the least proportion of blood (2·25 per cent.) was fat throughout; on the back the fat was 14 cm. thick, the muscles of the body being marbled throughout.

In cattle more blood was found than in swine; however, the average quantity for cattle is rather too high, because seven out of the fourteen experimented on were calves, which contain a greater proportion of blood than fully-grown animals. Yoke oxen in hard condition, with little fatty deposit, contained a higher percentage of blood than stall-fed animals, *i.e.*, milch cows and fattened bullocks.

Inspection of the above table shows that in both individuals and species considerable variations occurred, and that an increased proportion of blood—a polyæmia—not unfrequently took place.

Whether and how far these variations were normal or pathological cannot be settled without further investigations, as it is evident that the boundary between physiological sanguineousness and pathological plethora is not a fixed one.

It will also be noticed that the absolute proportion rises with the weight of the body ; not so the relative, doubtless owing to the accumulation of fat. A horse in regular hard work will contain more blood than he will if used, say, for breeding, and leads an easy life. In the same way, a lean, muscular dog in constant movement will contain a great quantity of blood.

These statements are confirmed by chemical and anatomical observations on mankind. It is a settled principle that in strong, well-fed men, in hard condition, an increased quantity of blood is regularly present.

Our results entitle us to lay down the principle : Between the development of voluntary muscles, including the heart, and the blood-quantum, there is a direct and important proportion. All thoroughbred muscular animals are provided with strongly-developed hearts, large in volume and heavy in weight. Badly or moderately-fed animals have a small blood supply ; only very lean animals form an exception to the rule, evidently on account of their emaciation the proportion remains unaltered, although quantitative changes (Hydræmia oligocythæmia) may often be found.

Dr. Bollinger continues : With reference to the closer relations between blood and muscle, I wish to remind you that in well-developed men more than half the entire bodily weight is composed of voluntary muscle—thirty-five kilos of muscle to sixty-five of bodily weight (Birch-Hirschfield) ; further, that one-fourth to one-third of the entire blood is normally found in the muscles, which, under certain circumstances (*i.e.*, intense Tetanus), may rise to two-thirds (J. Ranke).

High feeding, associated with muscular repose, results not in plethora, but on the contrary in anæmia. Fattening leads to anæmia, and under certain circumstances anæmia leads to fattening. This is known to feeders, who make practical use of the knowledge by first bleeding their animals when about to put them up to fatten.

According to Von Voit, the result of hæmorrhage is that less fat is oxydised, more albumen decomposed, and less CO_2 excreted.

These changes explain fatty accumulations from anæmia. Therefore, fatty infiltration and anæmia are favourable to their mutual development. An organ suffering from fatty degeneration, say the liver or the kidney, is always found to be anæmic in a high degree, at times even void of blood.

Anæmia will also explain the want of stamina in fat men and animals, who tire easily and are incapable of strong exertion, whereby in bad cases cardiac weakness plays a part (adipositas cardis, etc.). At all events the mass of accumulated fat acts as a drag, a dangerous passive impediment.

Age has little effect on blood volume, only young, growing animals in good condition contain proportionately more blood than fully-grown ones.

Sex has also little effect. Males– for instance, stallions, average a larger quantity of blood than females—mares, because they have a stronger muscular development.

Pregnant animals hold a special position in this respect. It has been found that pregnant cows and sheep in the first period, show no increase in blood quantum, but in the later stages a considerable increase takes place.

Castrated animals are generally deficient in blood—probably on account of increased fatty deposit. It is not improbable that the change in the animal's constitution (quietness of temperament and sluggishness) plays an important part in the matter.

There is an important point which I have not yet touched, namely—the quality of blood in increase or decrease of the same.

It is known that anæmia is often combined with hydræmia and oligocythæmia. Experiments upon strong, healthy persons of sanguine temperament (physiological plethora) have demonstrated a direct relationship between quantity and quality of the fluid.

Andral, Pavarett, and Delafond found in five strong sheep that the number of red blood corpuscles were a-third above the average. On the other hand, in anæmia the number of red corpuscles diminish considerably, sometimes to one-half and even more below the average. It is also known that an increase in the blood quantum is not necessarily a true plethora, for disturbed renal function and chronic cardiac disorder often bring about hydræmic plethora —a pseudo-hypertrophy of the blood.

Phlebotomy in normally sanguine or plethoric individuals only temporarily diminishes the blood quantum ; the principal effect is chiefly a qualitative alteration—the blood becomes poorer in solids, which however are promptly replaced by proper nutriment. On the other hand, great aqueous loss (such as by perspiration) decreases the volume of, and thickens the blood.

Let us return to the original question : Does true plethora exist ?

The general results of published investigations are not favourable to Cohnheim's views. Bona-fide plethora should occur more rarely in animals than in man, because animals live more naturally, and (if we except fattening animals) they are able to work off excess of food by constant exercise. Plethora may occur in the following cases : (1) It may occur temporarily in the first stages of the process of fattening ; (2) in working animals when thrown out of work for a time ; (3) in pampered animals, such as pet dogs, which are overfed and have little exercise. In any case, as already stated, both in man and in animals, it is very difficult to draw a sharp line between physiological sanguineousness and pathological plethora.

It appears to be quite admissible to apply observations made with animals to man ; and when it is borne in mind that the causes of sanguinity exist in the latter in a far higher degree (over-eating, over-drinking, and want of exercise) than in the former, the conclusion is not far to seek, that a true plethora is at least possible in man. Indeed, there is *à priori* no reason why pathological excess of blood should not occur, as no one doubts that the converse frequently happens.

I would point out, continues Bollinger, that besides the enumerated causes for plethora, there probably exists a natural predisposition in some individuals, as is the case with obesity.

To demonstrate the occurrence of a genuine plethora in man, is an important problem for pathologists.

When they are in a position to show the following appearances in selected, well-fed subjects, then the conclusion will be admissible that the anatomical and clinical phenomena observed are due to a genuine polyæmia. The appearances referred to are as follows : A considerable dilation of the entire circulatory apparatus (heart and blood-vessels), the walls of the heart thickened, from no other cause ; when streams of blood flow from the great vessels of the thorax ; when the dilated and hypertrophied heart is filled to overflowing (strotzen) ; when clinical and other observations during life have proved the patients to have been great eaters and drinkers who took little bodily exercise ; when during life the already-mentioned symptoms of plethora were patent ; and lastly, when the subject has been proved to have succumbed from insufficient cardiac action, rapidly or slowly, as the case may have been, or to have died of an Apoplexy without any important lesion of the blood-vessels.

As regards the behaviour of the blood-vessels in such individuals, I would point out, says Bollinger, that they adapt themselves to the volume of the blood ; thus, in chronic anæmia, we find the internal cubic space of the heart

and blood-vessels to be small, in sanguine persons it is great. Virchow's so-called Hypoplasia of the Arteries, which may be congenital or acquired, is probably only a secondary result of anæmia, wherewith qualitative changes in the blood, acting prejudicially upon the development of the walls of the vessels, may have come into play.

From these observations it may be concluded, Bollinger goes on to say, that muscular exercise and muscular development, with proportional nutrition are the most powerful regulators of the blood, not only as to quality, but also as to quantity.

This corresponds completely with the views of physiologists: "Work causes diminution of blood in the organism primarily; this diminution is great in proportion to the amount of muscular exertion. Habitual increased muscular exercise, increases, secondarily, the blood; long muscular rest decreases the blood" (J. Ranke); but pathological observations show that the latter phenomenon can probably be compensated by immoderate nutrition.

Hence we are justified in regarding muscle and blood, quantitatively, as being in a certain sense co-ordinate products of the same momenta, viz., of corporeal work and proper food. On the other hand, we may look upon an over-proportion of fat and that important factor, tissue change, as inimical to blood and muscle.

As to the relationship of sanguineousness, on one side, and anæmia, on the other, to disease, Bollinger states: Physiological plethora is the greatest protection against and during disease. This is proved by modern blood-sparing methods, as employed by surgeons and synœcologists. It is a doctrine which has thoroughly permeated the minds of surgeons, fortunately.

It has been proved by recorded facts that pathological plethora may act directly in a pathological manner. Anæmia, on the other hand, is also a dangerous possession; it predisposes to numerous more or less dangerous diseases, notably to Tuberculosis. It is worthy of remark that the least sanguine animals, such as bovines and swine, with relatively small hearts, are most susceptible to Tuberculosis; whereas that disease hardly occurs in muscular, full-blooded animals, such as dogs and horses. However, it should also be borne in mind that milch cows and fattened animals are submitted to many damaging influences from which dogs and horses escape, being kept in a state more resembling that of nature.

ACUTE NEPHRITIS IN LAMBS.*

BY W. ROGER WILLIAMS, F.R.C.S., SURGEON TO THE WESTERN GENERAL DISPENSARY, SURGICAL REGISTRAR TO THE MIDDLESEX HOSPITAL.

IN the spring of 1884 I received a letter from my friend Dr. Unwin, of Dunchurch, near Rugby, asking me to investigate a fatal malady with which the lambs in his neighbourhood were afflicted.

He said "the farmers about here have suffered serious losses this spring, owing to a great number of deaths occurring among the newly-born lambs. I have been asked to explain the nature of the disease (people think the doctor ought to know everything) which kills so many of the young lambs, and also to suggest a remedy. I thought it possible that if the symptoms were described, and you received a body, you might make a P.M. and spot the disease."

Well, in accordance with this, I received the bodies of two lambs, one of which had died of the disease, and the other had been killed whilst suffering from it, being then nearly three weeks old.

* A paper read before the Pathological Society of London, on April 6th, 1886.

From the account of the disease that had then reached me, I was quite prepared to find Rickets. Therefore, on opening the first body, I was not surprised to see the bladder moderately distended with turbid, whitish urine, which deposited much sediment on standing. This I carefully collected, and proceeded to look for phosphates, but was surpised to find instead—*albumen;* moreover, the urine was *acid.* On microscopical examination, no casts, crystals, pus, or blood could be detected, but on removing the kidneys, these presented well-marked signs of disease. The capsules separated very readily, exposing a yellowish surface, mottled by the congested stellate veins. On section the cortex was swollen, and of a pale yellowish tint, and *exceedingly soft;* the pyramids were firm and of a deep red colour. On *microscopical examination* the disease was seen to be acute Tubal Nephritis. The uriniferous tubules of the cortex were choked and distended by the swollen and degenerated epithelium. In most of the sections the outlines of the individual cells could not be recognised, though the nuclei could often be made out. The cells were in such an advanced stage of granular degeneration that, for the most part, they had not taken the logwood stain, although the malpighian vessels and adjacent structures had done so. Indeed, the malpighian vascular tufts appeared to be unduly prominent; contrasting markedly with their epithelial lining, the cells of which were in an advanced stage of granular degeneration, and like those of the uriniferous tubules had refused the stain. The whole of the tubules of the cortex of each kidney were thus affected, but the interstitial tissues presented a perfectly normal appearance. The epithelium of the tubules of the pyramids was but little affected.

The kidneys of the second lamb presented identical changes, only less advanced. In the specimens now before the society, all these changes can be seen.

All the other organs and parts of the bodies were carefully examined, but nothing abnormal could be detected about them. I paid particular attention to the *skeleton*, the *brain*, the *spinal cord*, and the *navel*, which parts I now exhibit, but they appeared to be quite free from disease. I also show some microscopical cross sections of the spinal cord, which are normal.

In the course of further correspondence with Dr. Unwin and Mr. Goodacre, a farmer who has lost scores of lambs from this disease, I elicited the following particulars:—These lambs show want of vitality as soon as lambed, and they are wet-born, *i.e.*, with watery confinements. The disease generally appears soon after birth, but some lambs are born with it, in an almost inanimate condition; these die in a very short time. In most cases difficulty in walking is the first symptom; the animals reel and stagger about; hence the disease goes by the name of "Rickety." Subsequently they are unable to walk at all, or even to stand; they fall and remain lying on one side. The loss of power affects all the limbs equally. They suck ravenously when the teat or bottle is brought to them; thus they may linger on for two or three weeks, but in the end always die. Mr. Goodacre writes, "There seems to be no outgrowing it; they get worse and die if they don't finish their course in some ditch or pit."

Dr. Unwin, who had one under observation in his paddock for nearly a fortnight, writes, "It could eat and drink when food was brought to it, as freely as a healthy lamb. It was quite conscious, and had no cough or difficulty in breathing, and its excretions appeared normal. Yet it could not stand, but would struggle and kick violently as it lay on its side. It could feel the prick of a pin in all its extremities. When placed on its feet it immediately dropped on its side, and had tremors and choreic movements, which it could not restrain for some time. In this recumbent position it could not graze."

Sometimes the disease is said to terminate in what the shepherds call "the

evil," that is, an enlargement of the joints with pus in them, and pus all along the spine. I am inclined to believe, however, that this is in all probability a separate disease, Pyæmia, in connection with suppuration of the remains of the umbilical cord.

In no case, so far as I can ascertain, were any marked febrile symptoms present, such as might be supposed to indicate Scarlet Fever, etc.

With regard to the natural history of the disease, I have these facts to relate.

It has been known on some farms for many years—some years more than others. It is now pretty general in the neighbourhood of Dunchurch. It is a local disease, only in the sense that it affects the lambs of ewes recently imported from Scotland.

Last spring (1884) some farmers lost two or three lambs, whilst others lost dozens. Mr. Goodacre writes, "The vets. know nothing decidedly about the disease, so far as I can gather." I have certainly failed to find any description of such a disease in the chief works on veterinary medicine. It has been observed that the disease is almost entirely confined to the offspring of the imported ewes with home-bred rams. But occasionally a case occurs when the ewes of the country are served with home-bred rams. The imported ewes are of the black-faced horned Scotch and Cheviot breeds. They were introduced into the neighbourhood several years ago to cross with home-bred rams on account of the frightful losses sustained from "Rot," when the home-bred ewes were employed. It was then the custom, under the belief that one ram could serve a very large number of ewes, to allow only one ram to about fifty or sixty ewes. With the home-bred ewes this seems to have been attended with no evil results, unless predisposition to the ravages of "Rot" be so regarded. With the imported Scotch ewes about the same proportion of rams was maintained for breeding purposes.

Mr. Goodacre informs me that he has tried the effect of putting one ram to every ten ewes, with the result that many of the ewes had two lambs, and in all these cases their offspring appeared to be unusually robust. The imported ewes are brought from Scotland about three weeks before putting to ram. The offspring of both the breeds are equally liable to the disease. They come from a hilly country, where they subsist on meagre diet in a half wild state. For breeding purposes the sheep are carefully selected, and only healthy ewes are employed.

The lambs are engendered, born, and reared in the open. I paid a visit to the neighbourhood and found a gently undulating grazing country, with plenty of large trees, high hedgerows, and coarse, rank grass. The soil, cold, heavy, and of wet clay. In the lambing season the east winds exceedingly cold and nipping.

Such being the facts, I am inclined to attribute the disease to these two causes.

In the first place and chiefly, to the injurious action excited by suddenly plunging the ewes into these rigorous external conditions, without any previous gradual acclimatisation, whereby the offspring were born with constitutions out of harmony with the environment, as manifested by the appearance of the disease in birth, or shortly afterwards. Under the circumstances, I think we need not be surprised that this should be so, although the mothers exhibited no obvious departure from the standard of health. It is notorious that each kind of animal is best adapted to the particular climate of its own home. Darwin has made us familiar with the extreme susceptibility of the reproductive system, and especially of the female reproductive system, to changed and abnormal conditions in the environment. By exposing the parents to certain extraordinary conditions of life, as is well known, monstrosities may be artificially produced in the offspring,

without any obvious departure from health having ensued in the parent. The morbid influence thus generated, issues, through the parental reproductive system—as disease in the offspring. I regard the present disease as most likely developed in an analogous manner. The phenomena of healthy life are located in the protoplasm of the body, and it is to the protoplasm that we must look for the real phenomena of disease, rather than to the neuro-vascular conditions. The morbid impulse (molecular protoplasmic disturbance) thus generated in the maternal renal epithelium, appears as disease—Nephritis—in that of the offspring.

The second factor in the causation of the disease may, I think, be attributed to the serving so many ewes with but a single ram. There can be no doubt that such a course must tend to enfeeblement of the offspring. Mr. Goodacre's before-mentioned experiments in breeding confirm this view; which is also borne out by the following considerations. In the simplest form of gamogenesis—*conjugation*—two similar protoplasmic sexual elements, derived from different sources, fuse together, and the new individual is developed from the resulting newly-formed mass. Here the two sexual elements concerned are of equal morphological value, as they are also in the case of plants, a single pollen grain being the morphological equivalent of the oösphere. But in the higher animals, a single spermatazoon is not the morphological equivalent of a germ cell (ovum); its equivalent is the spermatoblast which may originate many dozen spermatazoa. The essential thing in the process of impregnation is the physical admixture of *protoplasm*, derived from different sources; the nuclear phenomena are of quite secondary importance. Reasoning by analogy, therefore, we should expect in these animals that many spermatazoa would be necessary to fertilise the ovum. And it appears to be the fact in the higher plants and animals that more than a single spermatazoon is requisite to fertilise properly the ovum—the observations of Selenka on echinoderms to the contrary notwithstanding.

Thus Newport has pointed out that when only a small number of spermatazoa are applied to the ova of Batrachians, they are only partially impregnated, and the embryo is never developed.

With regard to plants, Kölreuter and Gärtner have obtained nearly similar results. Naudin's experiments on Mirabilis are especially interesting. He fertilised a flower with three grains of pollen, and succeeded in producing perfect seed; but when he used only two grains and finally a single grain, in a series of seventeen experiments, he only succeeded in getting two seeds formed, and the plants produced from these never attained their proper dimensions and their flowers were remarkably small.

In conclusion, it only remains for me to thank Dr. Unwin and Mr. Goodacre for their kindness in supplying me with the facts relating to this case.

FELLOWSHIP OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

THE first examination held in Scotland for the above degree took place in Edinburgh on April 29th, 1886, when the following gentlemen were admitted Fellows of the Royal College of Veterinary Surgeons:—

R. Rutherford, Esq., Sec. Scottish Section Board of Examiners, Edinburgh
Archd. Robinson, Esq., Member of Board of Examiners, Greenock.
H. Lewis, Esq., Prof. of Anatomy, etc., New Veterinary College, Edinburgh.
J. Macqueen, Esq., Prof. of Anatomy, etc., Veterinary College, Glasgow.
W. O. Williams, Esq., Prof. of Morbid Anatomy, New Vet. Col., Edinburgh.
Joshua Nunn, Esq., Army Veterinary Department.
W. Wood, Esq., jun., Wigan, Lancashire.
James Weir, Esq., Glasgow.
W. Anderson, Esq., jun., Glasgow.

EXAMINATIONS OF THE ROYAL COLLEGE IN SCOTLAND.

At meetings of the Scottish Section of the Board of Examiners of the Royal College of Veterinary Surgeons, held in Glasgow and Edinburgh on and between April 13th and 29th, the following gentlemen passed their Final Examination, and were admitted members of the profession :—

Glasgow Veterinary College.

Mr.	H. D. Richard	Festiniog, Merioneth.
„	R. B. Freeman	Clontarf, Dublin.
„	R. M. Hamilton	Glasgow.
„	J. McClean	Killcoo, Co. Down.
† „	R. Barron	Sutton, Chester.
„	R. Marsh	Ballynahinch, Co. Down.
„	J. Dawson	Cootehill, Co. Cavan.
„	R. M. Malloch	Manchester.
„	J. Nicholson	Thornliebank, Renfrew.

Dick Veterinary College.

Mr.	J. F. Soga	Cape Colony.
„	T. Barker	Harrogate.
„	J. Loughlin	Newbridge, Kildare.
„	A. R. Young	New Scone, Perth.
„	G. Howie	Turriff, Aberdeen.
„	W. L. Weighill	West Hartlepool.

New Veterinary College.

Mr.	T. A. Porteous	Edinburgh.
„	J. Urmson	Bolton.
„	E. W. Hoare	Cork.
„	M. J. Cleary...	Mullingar.
„	P. Bell	Hawick.
„	J. Buxton	Manchester.
„	W. Hall	Royton, Lancashire.
„	F. W. Somers	Leeds.
„	C. Blackhurst	Preston.
„	T. S. Atkinson	Bolton, Lancashire.
„	T. G. Peacock	Limerick.
„	R. H. Settle	Bolton.
„	C. Aggio	Colchester.
„	B. W. Blomfield	Tasbrough, Norfolk.
„	W. Kidd	Alexandria, N.B.
„	A. Spruce	Dudley.
„	T. Bowhill	Ayton, Berwickshire.
„	J. Malone	Wexford.

The following passed their *Second Examination* :—

Dick Veterinary College.

Mr. F. R. Coleman.
* „ C. R. Sephton.
* „ J. Stewart.
„ E. Morgan.
„ J. George.
* „ J. W. Logan.
„ G. Sinclair.
„ W. Skinner.
Mr. Edmundson.
„ J. Cowan.
„ J. Jackson.
„ J. Hughes.
„ W. Henderson.
* „ J. Pottie.
„ G. Harle.
„ W. Cronyn.

Mr. R. Milne.
„ G. Parr.
„ J. Whyte.
Mr. D. O'Regan.
„ E. C. Winter.
„ C. Campbell.

New Veterinary College.

Mr. L. J. Lloyd.
„ J. Webb.
„ G. Ratcliff.
„ F. W. Grenfel.
„ J. Gregory.
* „ F. Austerberry.
„ W. F. Shore.
„ T. J. Wilson.
„ A. W. S. Williams.
* „ G. Howe.
„ O. Thomas.
„ J. Matthews.
† „ J. R. Charlton.
Mr. E. Siddall.
„ R. Shenton.
„ W. Tait.
„ J. Aitken.
† „ E. Lawrence.
„ J. L. C. Jones.
„ G. Craik.
„ R. Scott.
„ E. A. Saxton.
* „ W. C. Hazleton.
„ O. J. Williams.
* „ F. Smith.
† „ J. Clarkson.

Glasgow Veterinary College.

Mr. R. O. Stafford.
* „ J. Spence.
„ J. McNairn.
„ A. Welsh.
„ H. Williams.
„ H. Begg.
„ T. B. Hamilton.
„ W. Grinton.
* „ J. Kernochan.
Mr. T. J. Campbell.
„ A. S. Macqueen.
„ J. McLean.
* „ T. Miller.
„ J. Shade.
* „ J. McKerlie.
„ W. D. Smith.
„ W. McKie.

The following passed their *First Examination* :—

Dick Veterinary College.

Mr. A. Hamilton.

Glasgow Veterinary College.

Mr. H. J. Windsor.
„ S. E. Dunn.
Mr. W. Smith.
„ J. Watson.

New Veterinary College.

* Mr. E. Wilkinson.
„ J. Lindsay.
„ H. S. Jones.
„ T. Snarry.
„ F. W. Cosgrove.
„ J. Appleyard.
Mr. W. A. Abbott.
„ G. Scoon.
* „ J. Dunnett.
„ J. Garland.
„ J. D. Baker.
† „ M. Eaton.

R. RUTHERFORD, F.R.C.V.S.,
Secretary, Scottish Section, Board of Examiners.

* Marked thus passed with "Great Credit.
† Marked thus passed with "Very Great Credit."

GLASGOW VETERINARY COLLEGE.

THE winter session of this institution terminated on the 16th April, and on the 19th, 20th, and 21st the oral examinations of the Royal College of Veterinary Surgeons were conducted within the museum of the college. The candidates for diploma were also subjected to a rigid practical examination on horses, cattle, and sheep, selected and brought to the college for that purpose. The board of examiners included:—Mr. George Fleming, LL.D., F.R.C.V.S.; Mr. J. Roalfe Cox, F.R.C.V.S.; Professor Pritchard, M.R.C.V.S.; Professor Duguid, F.R.C.V.S.; and Mr. J. Vaughan, F.R.C.V.S., London; Mr. W. A. Taylor, F.R.C.V.S., Manchester; Mr. George A. Banham, F.R.C.V.S., Cambridge; Mr. Archibald Robinson, M.R.C.V.S., Greenock; and Mr. Richard Rutherford, M.R.C.V.S., Edinburgh. The following gentlemen were also present as *ex-officio* members:—Principal M'Call, Professors Cooke, Macqueen, Limont, and Renfrew, Glasgow Veterinary College.

Five students were examined for the "A" or first examination, and of this number four passed, viz.:—Mr. Samuel E. Dunn, Cheshire; Mr. John Watson, Sheetleston; Mr. H. J. Windsor, Govan; and Mr. William Smyth, Katesbridge, Ireland.

Twenty-two students presented themselves for the second professional examination, and of this number the following were successful in passing:—Mr. R. O. Stafford, Dumfries; Mr. T. J. Campbell, Stranraer; Mr. Joseph Spence, Portadown, Ireland; Mr. Andrew S. Macqueen, Glasgow; Mr. James M'Nairn, Newton-Stewart; Mr. John M'Lean, Ligoniel, Ireland; Mr. William Welsh, Glasgow; Mr. Thomas Millar, Glasgow; Mr. Hugh Williams, Holyhead, North Wales; Mr. James Shade, Glasgow; Mr. Hugh Begg, East Kilbride; Mr. John M'Kerlie, Drummore, Wigtownshire; Mr. Thomas B. Hamilton, Hamilton; Mr. W. D. Smith, Dundalk, Ireland; Mr. William Grinton, Kirkcaldy; Mr. William M'Kie, Carlisle; and Mr. John Kernohan, Ballymena, Ireland.

The following gentlemen were awarded the diploma of the Royal College of Veterinary Surgeons:—Mr. H. Owen Richard, Festiniog, North Wales; Mr. R. B. Freeman, Dublin; Mr. Robert Barron, Sutton, Cheshire; Mr. John Nicholson, Thornliebank; Mr. James Dawson, Cootehill, Ireland; Mr. Richard Marsh, Ballynahinch, Ireland; Mr. Robert M. Malloch, Braco, Perthshire; Mr. Richard M. Hamilton, Ayr; and John M'Clean, Castlewellan, Ireland.

Prize List.

Medals, granted by the Highland and Agricultural Society of Scotland, the late Professor Allen Thomson, of London; Mr. Thomas Campbell, F.R.C.V.S., Kirkcudbright; and Principal M'Call, and certificates of merit by the college, were awarded in the different branches of study as follows:—

Horse Pathology (written examination).—Gold Medal (Principal M'Call)—Mr. Barron. Silver Medal. (H. and A. S. of S.)—Mr. Marsh. First-class Certificates—Messrs. Dawson, Richard, Gibson, and Malloch; Second-class Certificates—Messrs. Dalrymple, Clunas, Newlands, Cook, and Thompson.

Cattle Pathology (written examination).—Gold Medal (Principal M'Call)—Mr. Barron. Silver Medal (H. and A. S. of S.)—Mr. Dawson. First-class Certificates—Messrs. Clunas, Richard, Gibson, and Farquhar. Second-class Certificates—Messrs. Malloch, Marsh, Freeman, Cook, and Nicholson.

Practical Examination of Horses as to Age, Soundness, Operations, &c.—Gold Medal (Principal M'Call)—Mr. Robert Barron.

Practical Examination of Cattle and Sheep as to Age, Soundness, Operations, &c.—Gold Medal (Mr. Campbell)—Mr. Robert Barron.

Morbid Anatomy (written examination).—First-class Certificates—Messrs.

Barron and Dawson. Second-class Certificates—Messrs. Marsh, Caldwell, Thomson, Gibson, Farquhar, Richard, and Howard.

Anatomy (special and comparative).—Medallist—Mr. James M'Nairn. First-class Certificates—Messrs. Williams, Begg, M'Kerlie, and M'Kie. Second-class Certificates—Messrs. Stafford, Kernohan, and Millar.

Histology and Physiology (written examination).—Medallist—Mr. Andrew S. Macqueen. First-class Certificates—Messrs. M'Nairn, Begg, M'Kie, M'Kerlie, and Millar. Second-class Certificates—Messrs. Kernohan, Welsh, and Grinton.

Best professional examination in Anatomy and Physiology—Gold Medal (the late Professor Allen Thomson)—Mr. James M'Nairn.

The prize for best dissection (awarded by Mr. M'Kenzie, of Golspie) was gained by Messrs. Stafford and Macqueen.

At the close of the examinations the Secretary of the Board of Examiners intimated that Messrs. M'Nairn, Millar, M'Kerlie, and Kernohan had passed with "great credit," and Mr. Barron with "very great credit."

NEW VETERINARY COLLEGE, EDINBURGH.

PRINCIPAL WILLIAMS distributed the medals of the Highland Society, and other prizes, to the successful competitors on Wednesday, the 14th April, the following being the list:—

Pathology of the Horse.—T. Bowhill—Silver Medal; Certificates of Merit—J. Buxton, George Finlay, W. Hall, E. W. Hoare, M. J. Cleary, T. A. Porteous, and A. Watson.

Pathology of the Ox, Sheep, Pig, and Dog.—J. Buxton—Silver Medal; Certificates of Merit—T. Bowhill, G. Finlay, J. Urmston, T. A. Porteous, and M. J. Cleary.

Anatomy.—Joe Clarkson—Silver Medal; Certificates of Merit—J. R. Charlton and F. Smith.

Physiology.—Joe Clarkson—Silver Medal; Certificates of Merit—C. Hazleton and J. R. Charlton.

The Principal's £20 Prize.—T. Bowhill.

Veterinary Science of the Farm.—N. A. Moos—Silver Medal.

Bronze Medals were awarded to J. Buxton and C. Blackhurst for acting as Curators of the Museum.

Bronze Medals were awarded to C. Blackhurst, J. Urmston, G. Finlay, P. Pike, and P. Bell for best Anatomical Preparations.

Certificates of Merit were awarded to W. Hall and J. Hall for acting as Prosectors.

Certificates of Merit were awarded to J. Buxton, M. J. Cleary, A. Reah, C. Blackhurst, George Finlay, J. Urmston, S. T. Bradley, H. Newsome, P. Pike, P. Bell, W. Hall, T. Bowhill, W. J. Fletcher, A. Watson, F. Armstrong, P. Young, T. A. Porteous, E. W. Hoare, W. M. Peffers, T. Watson, E. Collins, T. Dunwoodie, for very satisfactorily performing the duties of dressers, dispensers, and visitors during the summer and winter session 1885-86.

Messrs. T. Bowhill, G. Finlay, and J. Urmston were selected to represent the College in the competition for General Sir Frederick Fitzwygram's prizes.

ONTARIO VETERINARY COLLEGE.

THE termination of the session of this school took place on March 26th, when the diplomas and prizes were awarded.

Dr. Andrew Smith, Principal of the Institution, occupied the chair, and

with him on the platform were: His Honour the Lieut.-Governor, Professor Goldwin Smith, Drs. Thorburn, Duncan, and Barrett, Messrs. Henry Parker and Henry Wade, the President and the Secretary of the Agricultural and Arts Association, Professor Babington, Major Lloyd, and E. King Dodds. Several hundred students were present.

The CHAIRMAN, in his opening remarks, stated that the past year had been the most successful yet reached in the history of the College. There had been about 300 students on the roll, of whom one hundred and thirty had come from the United States. (Applause.) The examination recently held had been of a high standard, and the awards had been strictly impartial.

Diplomas awarded.

Dr. DUNCAN then read the list of candidates to whom diplomas had been awarded, as follows:—Geo. Alexander, Strathroy, Ont.; G. H. Allen, Grand Rapids, Mich.; F. E. Anderson, Corey, Ohio; M. O. Anderson, Selkirk, Ont.; R. W. Ardary, Pittsburg, Pa.; E. M. Bergen, Chicago, Ill.; S. E. Boulter, Cheapside, Ont.; H. Bowles, Hancock, N.Y.; E. H. Bradley, Lansdowne, Ont.; G. C. Brock, Thamesville, Ont.; Wm. H. Brown, Caledonia, Ont.; B. F. Butler, Sterling, Ont.; J. F. Butterfield, Montrose, Pa.; James Cannite, Consecon, Ont.; Geo. S. Cavin, Burr, Ont.; E. W. Cheseman, Corinth, Ont.; T. Connolly, Tonawanda, N.Y.; W. C. Daniels, Democracy, Ohio; A. V. Dun, Mansfield, Ohio; Geo. W. Dickey, Forest, Ont.; H. E. Dilatush, Lebanon, Ohio; R. R. Dinwiddie, Ohio; J. S. Donald, Vittoria, Ont.; W. L. Drinkwater, Alton, Ont.; Thomas Dunphy, Crosswell, Mich.; W. Everest, Altoona, Mich.; R. E. Folkes, Hillington Lynn, Eng.; B. E. Friel, Stouffville, Ont.; D. Geddes, Bellgrave, Ont.; L. R. Grover, Bath, Pa.; R. J. Hall, Millbank, Ont; J. W. Howard, Belleville, Ohio; Eugene B. Ingalls, Mohawk, N.Y.; S. Jones, Walsh, Ont.; F. A. Jones, Balsam, Ont.; J. F. Jones, Newark, Ohio; Wm. Joyce, Mansewood, Ont; D. M. Keller, Williamsport, Pa.; A. H. King and J. E. King, St. Thomas, Ont.; Wm. Kirk, Gordonhill, Ont.; T. E. Macauley, Coldstream, Ont.; D. Maclean, Mitchell, Ont.; D. W. Mack, Ontario; H. S. Manhard, Brockville, Ont.; R. J. McCallister, Bailieboro', Ont.; T. C. McCasey, Wingham, Ont.; M. C. McClain, Jeromeville, Ohio; W. P. McClure, Brampton, Ont.; A McDonald, Paisley, Ont.; Asa McQueen, Liverpool, N.Y.; E. Miller, Kings, Ill.; R. Parks, New York City; G. C. Pritchard, Grenville, Mich.; J. M. Ramsey, Mongolia, Ont.; A. J. A. Robillard, Ottawa, Ont.; Louis A. Robinson, Buffalo, N.Y.; George A. Scott, Parkhill, Ont.; John Scott, Alton, Ont.; J. J Shoemaker, Bluffton, Ind.; John R. Litterly, Scranton, Pa.; Charles L. Smith, Brantford, Ont.; E. B. Smith, Toledo, Ohio; John Spencer, Brooklyn, Ont.; Wm. Standish, Owen Sound, Ont.; E. Harcourt Stanley, Ottawa, Ont.; R. P. Steddom, Dayton, O.; Wellington T. Stewart, Harriston, Ont.; C. H. H. Sweetapple, Oshawa, Ont.; Hugh Thompson, Hornellsville, N.Y.; J. J. Toussaint, Milwaukee, Wis.; S. J. Wallace, Orangeville, Ont.; Adam Watson, Toronto, Ont.; H. S. Wende, Erin, N.Y.; M. B. Whitehead, Youngstown, Ohio; John Williams, Lima, Ohio; E. T. Williams, Stouffville, Ont.; Thomas Wilson, Wingham, Ont.

S. Schwartz, primary in Materia Medica; R. H. McInch, D. Bell, Geo. Baxter, A. C. Wolfe, primary in anatomy.

THE HONOURS LIST.

Seniors.

Pathology.—Silver medal, G. W. Dickey; 2nd prize, A. King; 3rd prize, John Scott. Honours: M. O. Anderson, George Alexander, F. E. Anderson, G. H. Allen, G. C. Brock, E. H. Bradley, J. Carnrite, C. W. Cheseman,

R. R. Dinwiddie, W. H. Everest, L. R. Grover, J. W. Howard, W. Joyce, J. F. Jones, S. Jones, F. A. Jones, W. Kirk, D. M. Mack, W. P. McClure, Asa McQueen, T. E. Macauley, T. C. McCasey, R. Parks, G. A. Scott, C. L. Smith, E. B. Smith, R. P. Steddom, J. Spencer, J. G. Toussaint, S. J. Wallace, E. G. Williams, M. B. Whitehead.

Anatomy.—1st prize, G. W. Dickey; 2nd prize, R. R. Dinwiddie; 3rd prize, John Scott. Honours: G. Alexander, F. E. Anderson, S. E. Boulter, E. H. Bradley, G. C. Brock, B. F. Butler, J. Carnrite, W. C. Daniels, T. Dunphy, W. Everest, F. A. Jones, J. F. Jones, D. M. Keller, A. King, W. Kirk, T. E. McCasey, W. P. McClure, A. McDonald, R. H. McInch, Asa McQueen, T. E. Macauley, J. J. Shoemaker, J. Spencer, R. P. Steddom, H. Thompson, S. J. Wallace, T. Williams.

Entozoa.—1st prize, R. R. Dinwiddie. Honours: G. Alexander, F. E. Anderson, B. F. Butler, G. W. Dickey, W. Everest, W. Joyce, D. King, T. E. Macauley, John Scott.

Microscopy.—Special Class.—1st prize, F. E. Anderson. Honours: J. F. Butterfield, G. W. Dickey. General Class: 1st prize, Asa McQueen. Honours: R. R. Dinwiddie, A. King, W. P. McClure, R. P. Steddom, H. Thompson.

Physiology.—1st prize, R. R. Dinwiddie; 2nd prize, W. P. McClure; 3rd prize, S. J. Wallace. Honours: E. W. Cheseman, G. Dickey, E. H. Bradley, R. P. Steddom, J. Scott, M. D. Anderson, G. E. Anderson, J. Ramsay, T. E. Macauley, A. McQueen, T. Williams, J. W. Howard, G. S. Cavin, M. B. Whitehead, C. L. Smith, J. E. King, A. H. King.

Chemistry.—1st, R. R. Dinwiddie; 2nd, W. P. McClure. Honours: E. W. Cheseman, R. J. Hall, J. F. Jones, S. E. Boulter, M. B. Whitehead.

Materia Medica.—1st prize, F. Scott; 2nd prize, G. W. Dickey; 3rd prize, R. R. Dinwiddie. Honours: W. P. McClure, D. W. Mack, T. E. Macauley, G. C. Brock, R. P. Steddom, M. D. Anderson, B. F. Butler, A. H. King, J. J. Shoemaker, J. F. Jones, David King, W. Everest, J. E. Anderson, H. Thompson, E. S. Williams, E. B. Smith, M. B. Whitehead, C. L. Smith.

Best General Examination.—1st, gold medal, given by the Ontario Veterinary Medical Association, John Scott. Honours: F. E. Anderson, G. W. Dickey, R. R. Dinwiddie, A. King, W. Kirk, W. P. McClure, Asa McQueen, L. A. Robinson.

Juniors.

Pathology.—1st prize, L. Brady; 2nd prize, F. Booker, W. T. Weese (equal); 3rd prize, J. Moore. Honours: E. Blackwell, J. C. Booker, E. A. Bradley, C. D. Beardsley, A. Barnes, J. Curphey, H. D. Chamberlain, H. Fee, H. Fry, B. Fletcher, A. Graham, A. Hutchings, B. Henderson, J. Rutherford, H. S. Richards, J. Steen, F. E. Wilkinson, R. M. Waldron, C. E. Winner.

Anatomy.—1st, silver medal, E. Blackwell; 2nd prize, F. Booker; 3rd prize, E. A. Bradley. Honours: J. C. Black, J. C. Booker, L. R. Brady, H. D. Chamberlain, C. G. Chase, H. Fee, H. Fry, H. S. Richards, R. M. Waldron, W. F. Weese, C. E. Winner.

Physiology.—1st. L. R. Brady; 2nd, W. Weese, E Blackwell (equal). Honours: C. E. Winner, A. Graham, F. Booker, J. Moore, J. Rutherford.

Chemistry.—1st prize, B. Fletcher. Honours: J. Moore, J. Harris.

The prizes having been presented to the winners,

His Honour the LIEUTENANT-GOVERNOR, by request of the Principal, delivered a brief address to the students. He congratulated the heads of the college upon the success it had already achieved, and said that in his opinion the Institution must be of great benefit to the province. He was glad to see that the number of students was yearly increasing, and that so large a proportion came from the United States. The youth of the United

Stated were noted for their patriotism and their attachment to their own institutions, and the fact that so many students came to the Ontario Veterinary College for instructions was a most significant testimony of the reputation the institution had gained on this continent. (Applause.) If they had not thought that the diplomas of the Ontario Veterinary College were of greater value than those of similar institutions in the United States they would not have come to Toronto.

Professor GOLDWIN SMITH made a felicitous speech. He expressed his conviction that the College was doing a good work. Horses were a source of riches and power to a nation, and where there were fine horses there were generally fine men. The object of the College was to increase the knowledge of the proper treatment of the horse in health and disease, and in carrying this out the Institution must confer a benefit on the country. He reminded the students that in these days it was acknowledged that with regard to disease prevention was better than cure, and they should therefore pay special attention to the treatment and diet of the horse with the view to keep it in health. In England the evil had been that disease had been produced in horses by over-feeding. The tendency to put horses too soon to work was the evil to be avoided in this country. He trusted to see in a few years Canada become the great breeding ground of horses for the English market.

After speeches from other gentlemen present, the proceedings terminated.

MONTREAL VETERINARY COLLEGE.

THE twentieth session of this institution was brought to a close on March 23rd, when the final examinations took place. Examinations were passed as follows :—

In Botany.—(Professor Penhallow, McGill University) Messrs. Craik, McGarth, Robertson, Becket, Smith, Murphy, Craig, Munro, Miller (John), and Roberts.

In Histology.—(Professor Wilkins, McGill University) Messrs. Craik, McGarth, Robertson, Becket, Smith, Roberts, Dawes, Reid, Torrance, Feron, Sangster.

In Physiology.—(Professor T. Westley, McGill University) Messrs. Wroughton, Feron, Rowat, Miller (Frank), Simpson, Craig.

In Chemistry.—(Professor Girdwood, McGill University) Messrs. Torrance, Rowat, Simpson, Murphy, Miller (Frank), Baker.

In Materia Medica.—(Professor Stewart, Veterinary College) Messrs. Torrance, Miller, Rowat, Craig, Simpson. Feron, Murphy, Dearden, Baker.

In Anatomy.—(Mr. Baker, V.S., Veterinary College) Messrs. Dyer, Sangster, Wroughton, and Whyte.

In General Pathology, Theory, and Practice of Medicine and Surgery.—(Principal McEachran, F.R.C.V.S., Veterinary College) Messrs. Wroughton, Whyte, Dyer, and Sangster.

The final examinations, before a Board of Examiners appointed by the Council of Agriculture, took place in the College lecture-room Tuesday morning. The Board was constituted as follows :—Messrs. William Bryden, V.S., Boston, Mass. ; Frank S. Billings, M.V., Roxbury, Mass. ; Arch. McCormic, V.S., Ormstown ; Charles C. Cowie, M.R.C.V.S., Ogdensburg, N.Y. ; J. A. Couture, V.S., Quebec ; A. W. Harris, V.S., Ottawa ; A. E. Cross, V.S., Montreal ; Charles Levesque, V.S., Berthier (*en haut*). The following gentlemen, having passed all the examinations and attended the prescribed number of sessions, were considered by the Board to be fully qualified to practise the science and art of veterinary medicine and surgery,

and were judged worthy to receive the diploma of the College :—Messrs. Wroughton, Whyte, Dyer, and Sangster.

The presentation of prizes and diplomas took place in the afternoon, Sir William Dawson, the principal of McGill University, presiding. There was a large attendance of the friends of the College and students. Dr. Leclerc, Secretary of the Council of Agriculture, read the report of the result of the various examinations and prizes. The Chairman then presented the prizes to the successful competitors :—

SENIOR CLASS.—*For the Best General Examination in all Branches.*—A Silver Medal, the gift of the Council of Agriculture, was won by Theodore A. Wroughton.

General Pathology, Theory, and Practice of Medicine and Surgery.—First prize, T. A. Wroughton ; second prize, J. D. Whyte.

Anatomy.—First prize, C. C. Dyer ; second prize, George Sangster.

SECOND YEAR.—*General Pathology, Theory, and Practice of Medicine and Surgery.*—First prize, W. J. Torrance ; second prize, A. Rowat.

Anatomy.—First prize, A. Rowat ; second prize, W. J. Torrance.

Materia Medica.—First prize, W. J. Torrance ; second prize, Frank Miller.

FIRST YEAR.—*Anatomy.*—George C. Becket.

Botany.—Galen Craik.

The Chairman then presented the diploma of the College to Messrs. T. A. Wroughton, C. C. Dyer, J. D. Whyte, and G. W. Sangster.

Sir WILLIAM DAWSON said though the number receiving diplomas was small, those who had received them might be congratulated on having gone through a most thorough course, for which they were greatly indebted to their instructors. It was a most fallacious method to judge a school by the number of its graduates. He hoped the time would come when, through Government aid, this school would cease to be a burden on its principal.

Mr. BLACKWOOD, representing the Quebec Council of Agriculture, said that during the year he had had occasion to examine into the condition of the men who had been educated at this College, and he was gratified to learn that every one whom he had been able to trace had been successful. This was a remarkable record, and an encouraging outlook to those now leaving the College, to whom, as an old man, he might be permitted to give one or two bits of advice. Certain temptations peculiarly surrounded the members of their profession. Let it be said of each of them, as he had once heard it remarked of their principal, that no money could affect his opinion of a horse ; and let them be careful about drink, which it would be hard for them to avoid. He had himself in 1836 come to the conclusion that his only safe course lay in total abstinence, which course he had never departed from.

Dr. HINGSTON, in adding his quota of advice to the young men, said it was their duty to take the position of gentlemen among society, and to uphold the dignity of their profession by their demeanour, as well as by their acquirements. He quoted some eminent examples of veterinary men who took the highest social places.

Dr. MCEACHRAN endorsed the advice that had been given them, as well as what had been said of the success of the graduates. A number of these now held teaching positions, and although from his experience he could not recommend this occupation as a money-making one, they could at all events assure themselves that those who had passed through the course prescribed by this College were qualified to teach.

The proceedings were then brought to a close.

The Montreal Veterinary Medical Association afterwards held a meeting for the purpose of conferring on the successful graduates the diploma of the Association. In presenting them, the President, Dr. Baker, warmly con-

gratulated the young men, saying he hoped they would always consider it an honour to possess these diplomas, and that the Association would always be equally proud of their holders.

Mr. Feron was then elected to fill the offices of Secretary-Treasurer and Librarian during the summer, after which the meeting adjourned.

The annual dinner took place in the evening at the St. Lawrence Hall.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

FORTY-THIRD ANNUAL GENERAL MEETING.

HELD ON MONDAY, MAY 3RD, 1886, AT THE NEW BUILDING OF THE ROYAL COLLEGE, RED LION SQUARE, W.C.

President, J. ROALFE COX, ESQ.

Members present: Nicholson Almond, W. J. Arkcoll, George A. Banham, J. D. Barford, A. W. Barnes, T. G. Batt, William C. Bland, E. E. Bennett, J. C. Bonnett, A. Bostock, W. Geo. Baswell, Thomas Briggs, A. Broad, Arthur Broad, James Broad, W. George Burrell, T. Caldecott, T. Campbell, B. Cartledge, H. J. Cartwright, Thomas W. Cave, R. Clarke, A. C. Cope, J. Roalfe Cox, W. W. Dollar, Edward C. Dray, W. Duguid, Henry Dyer, William Alston Edgar, Dr. Evans, A.V.D., Hugh Ferguson, Major-General Sir Frederick Fitzwygram, Dr. G. Fleming, W. Franklin, J. Fraser, James A. Gosling, H. D. Gibbings, Frank W. Gibbings, J. Gibbs, Thomas Greaves, W. J. Hatton, Stanford Harrison, E. A. Herron, J. Woodroffe Hill, Henry Hunter, William Hunting, James W. Ingram, Arthur H. Jacobs, F. Jarvis, A. Adrian Jones, A.V.D., H. Kidd, James Lambert, H. Laurence, H. G. Lepper, Clement Lowe, James Mackinder, W. F. Malvey, J. McCall, James Meredale, J. J. Meyrick, A. M. Michaelis, William Mole, Thomas Moore, W. H. Moore, D. McGill, J. B. Nisbet, G. A. Oliver, Alfred Over, J. M. Parker, H. R. Perrins, J. J. Philips, A.V.D., George Pickwell, Richard Poyser, A.V.D., J. S. Price, William Pritchard, F. Raymond, J. Reilly, A.V.D., Alex. G. Richardson, A.V.D., A. Rogerson, William Roots, James Rowe, F. G. Samson, Thomas Sangster, A. H. Santy, H. Sewell, H. K. Shaw, William Shipley, Henry J. Simpson, James F. Simpson, H. M. Singleton, Benjamin Smith, Frederick Smith, A.V.D., Henry M. Stanley, Peter Taylor, W. A. Taylor, F. Walker, James P. S. Walker, Thomas Walley, D. Y. Whitfield, William Whittle, William Wilson, Joseph Woodger, Edward Woodger, William Woods, J. Woof, F. W. Wragg, and the Secretary.

The SECRETARY (Mr. HILL) announced the result of the election as follows:—Mr. Simpson, 725; General Fitzwygram, 679; Mr. Storar, 517; Mr. Campbell, 486; Mr. Perrins, 464; Mr. Barford, 448; Mr. Simcox, 439; Professor Brown, 331; Mr. Blakeway, 311. The first six were declared to be elected.

Mr. DRAY proposed, and Mr. CARTLEDGE seconded, a vote of thanks to the scrutineers, which was unanimously adopted.

The PRESIDENT said it might be an unusual proceeding to venture to encroach upon the time of the meeting prior to entering upon the business of the day; but the present marked an event in their history exceptionally unique, as the profession were meeting to-day for the first time in their new building, and which is the first possession the Royal College has been in a position to acquire. The Council has, therefore, felt very desirous to inaugurate the occasion with a word of congratulation and welcome. The recognition of the need of such a building for the business of the College is by no means of

recent date, for the requirement was acknowledged by leading men in the profession years ago, and the Council of former times also contributed their best efforts to launch the project; but its completion has been delayed until the present day, the obstacles at the first seeming to be insurmountable. He could tell them that the Council, during the last two years especially, had borne up-hill work with collar pressure all the way in connection with enterprise, and none had flinched; and to-day they had the pleasure through him of bidding to the profession a hearty welcome to their new home, which they hope may prove a satisfaction and a success for years to come. (Applause.)

The SECRETARY read from the *London Gazette* the notice convening the meeting.

On the motion of Mr. DRAY, seconded by Mr. WOODS, the minutes of the last annual meeting were taken as read and signed by the President.

Mr. DRAY moved that the annual report be received and taken as read.

Professor WALLEY seconded the motion, which was carried.

Mr. PRICE opened the discussion. He observed that the Report was not set out in paragraphs and numbered, and he thought if this were done in future it would be found to be a great convenience. The Report could then be considered paragraph by paragraph; by that means discussion would be facilitated, and the thing would be thoroughly threshed out to the satisfaction of all present. He was very pleased to think that the Royal College of Veterinary Surgeons had at last taken into consideration the necessity of bringing an action against some of those individuals who still persisted in using the title of veterinary. He thought it would be as well if the different veterinary societies would take into consideration this important subject, and if the members would bring certain names before their respective associations, and the associations would send those names to the Royal College of Surgeons for prosecution, it would be doing the profession a considerable deal of good. The Registration Act was an excellent act in its way, and no doubt it would eventually do a great deal of good to the profession, but at present it had done considerable harm, because it had introduced a lot of men that were not looked upon formerly as qualified individuals, but were now looked upon by the general public as qualified veterinary surgeons, and were acting accordingly. They might depend upon it that unless they protected the term veterinary, they would be flooded with veterinary forgeries greatly to the detriment of the whole profession. He did not think the different medical societies would be going out of their way if they took this subject in hand and brought the matter before their respective meetings with a view to communicating the names of offenders to the Royal College for prosecution. Hitherto they had refrained from prosecuting because they did not call themselves a prosecuting body, but they had now undertaken the matter in three or four cases with satisfactory results, and that had cleared away the difficulty. Now they had once commenced they could not very well get out of it. Some arrangement as to the fines might, he thought, be made which would go towards the payment of the expenses. He believed the Society for the Prevention of Cruelty to Animals got half the fines (a voice, No). If it were not so all he could say was it ought to be. Coming next to the question of examination for the Fellowship degree, he was glad to see that the profession was making such rapid strides, and that this year instead of six or seven Fellows being admitted there were something like twenty-four or twenty-six. He wished particularly to draw attention to a matter which was mentioned on page 5 of the Report. It would be found there that any member of the College who wanted to present himself for the Fellowship degree had to get a certificate of good conduct and respectability from three Fellows. He was inclined to look upon that as a most objectionable clause. It did seem very much out of the way that members of the College

were not respectable enough to give such a certificate, but they must have a certificate of respectability from the Fellows if they wanted to present themselves for a Fellowship degree. He would suggest, therefore, the addition of the words "or Members" after the word Fellows, as he considered that the members were quite as capable of giving a brother member a good character as a Fellow, and with the permission of the President he would move that the words "or Members" be added. This passage of the Report would then read as follows :—"A candidate for the degree of Fellowship shall produce a certificate signed by three Fellows or Members of the Royal Veterinary College." He did not think the meeting could object to a simple alteration of that description. As to the requirement that candidates for the Fellowship should have been in practice for five years, he did not think that five years was long enough. He would be inclined to put it at ten years, because a young man might get a diploma at the age of twenty, and at twenty-five he might become a Fellow according to this paragraph. Thirty was quite young enough for any member to become a Fellow. He would therefore move "That a candidate for the degree of Fellowship shall produce a certificate signed by three Fellows or Members as to his status in the profession, and as to his having been in practice not less than ten years." As to the new building, so far as the room in which they were assembled was concerned, he thought it an excellent place for gatherings of this description. (Hear, hear.) This time last year he understood that members would have the privilege of being present at the laying of the foundation stone, and he thought the Council had made a grand mistake in not inviting them and giving them a grand dinner at the same time. If they had done so he believed to-day they would have been free of debt, as the occasion would have been favourable to the display of liberality. The Report expressed the hope "That a large and united effort will promptly be made by the members generally to launch their representative new building in a condition of completeness and freedom from debt or liability, remembering that this great endeavour to uphold the dignity of our profession compasses the interest of each individual alike." But he understood that this day the poor members of the College were to be disfranchised of their rights and privileges, and it seemed rather hard to ask them at the same time to give liberally towards a building like this, in the future management of which they were not to have any voice if this new Supplemental Charter was to come into force. The total building expenditure to date was put down at £4,739 19s. 11d., and he would like to ask about what the whole of the building would cost when completed. As to the Supplemental Charter of 1876, he had no doubt that his remarks would not meet with universal approbation ; but he did think it a pity that the members should be robbed of the rights and privileges which they had hitherto enjoyed, and he would propose a resolution to this effect :—"That this meeting of members of the veterinary profession desires the Council to apply for a Supplemental Charter, enabling all members who graduated prior to 23rd August, 1886, to retain all the rights of sitting on the Council and on the Board of Examiners if elected." Surely the Supplemental Charter of 1876 ought either to be repealed or another charter brought into existence to enable members to retain the rights which they obtained when they obtained their diplomas. No member of the Council who was not a Fellow would be able to sit on the Board after the 23rd of August next if this Supplemental Charter was put into practice, as according to law it was bound to be. There were several gentlemen on the Council at the present time who were members, but not Fellows, and of course they would have to vacate their seats. Up to last week Professor Pritchard and Professor Axe were only members.

Professor PRITCHARD said he would remain a member of Council, as he was a member of Council when the charter was obtained.

Mr. PRICE said that, at any rate, he presumed there would be some vacant chairs. (A voice, Only one.) One was sufficient as an illustration. He thought that he himself should have a right to be on the Council if members elected him. Of course that was a matter of opinion, but it was a matter that had excited considerable discussion throughout the whole of the profession. As time rolled on he hoped any differences of opinion between Fellows and Members would be swept away. A few days ago he read in the *Veterinarian* that Professor Pritchard and Professor Axe had had the Fellowship degree presented to them. In his opinion, there were no gentlemen in the profession who were more deserving of honour than those two gentlemen. Professor Pritchard especially had worked hard to uphold the dignity of the profession, and no form of honour that could be conferred upon them should be withheld, but it would also be as well if the same honour could be extended to members of the Edinburgh College, notably Professor Walley.

The CHAIRMAN said it had been done, the Council having been only too glad to include any gentleman who was a professor at the time. With reference to the remarks of Mr. Price, it was evident that one portion especially had given great satisfaction, viz., that referring to the increasing number of gentlemen who came forward to take the Fellowship degree. He had pleasure in announcing that in addition to the record last made, nine gentlemen had just taken the degree in Edinburgh, including some holding prominent positions in the profession. With reference to the propositions of Mr. Price, they could not be acted upon at this meeting, but they would be accepted as recommendations to the Council.

Mr. GLOVER said he had much pleasure in moving the adoption of the Report. Afterwards he would have pleasure in seconding the proposition of Mr. Price.

Professor PRITCHARD seconded the motion for the adoption of the Report.

Mr. HUNTING said that last year he had the pleasure of making a speech which was entirely congratulatory. On this occasion they had to congratulate themselves not only on their new building, but upon having got over the great difficulty concerning the Fellowship; for it would seem that members by their silence to-day had given assent to it, and had given up all this ridiculous assertion about the injustice of the proposition. (No, no.) He did not understand how members could complain of being treated with injustice. When some years ago the Council was instructed to obtain, and did obtain, after a great deal of trouble, a Charter of Incorporation from the Privy Council, containing amongst other things certain clauses relative to the granting of higher diplomas, the profession did it of their own free will and in the only manner in which it could legally be done, and now they grumbled and talked about injustice. But where was the injustice of their own actions? He could not see it. Again, it seemed to be thought that the only good of this Fellowship was that it gave a higher diploma, and was a sort of reward for scientific and literary attainments. It was nothing of the sort, but simply a sort of test or stimulus to make the members of the profession have a little more interest in scientific and literary matters, and also in professional matters, than they had done. It was common enough to hear members say they were taken by surprise at the time this charter was obtained. That was true, because they did not care one straw who were on the Council or what the Council did when they got there. Now, if they wanted to be on the Council themselves they must take a little interest in the matter and pass the Fellowship degree; it was because they had to take a little trouble in getting the Fellowship that all this row was kicked up. He could understand the objections of a man who could not pass a written examination which would satisfy the Examiners, but, on the other hand, they might object to such

a man representing them on the Council. It was only occasionally that a man had the impertinence to speak disrespectfully of the Fellowship examination. He used the word impertinence, because in doing so they must speak disrespectfully also of the Examiners, and he challenged any man in the room to find any three gentlemen whom they had less right to speak ill of than their present Examiners.

Mr. PRICE rose to order on the ground that nobody had ever made any observation against the three gentlemen to whom Mr. Hunting had alluded.

Mr. HUNTING said though gentlemen were not so impertinent as to speak disparagingly of the Examiners by name, by saying that the examination was not a test they insulted the Examiners. It was very well for gentlemen to say they did not go in for the examination on principle, but it was a tremendously high and mighty principle that a man showed when he would not take the trouble to do something which cost him money and trouble. He was inclined to think that they had heard nearly the last of the objections to the Fellowship degree. They had only to pay no earthly attention to what men on the other side had to say, and in twelve months' time they would have settled comfortably down, and most of them would have taken the degree.

Mr. GLOVER said he presumed it was intended to take the whole of the discussion before putting the motion for the adoption of the Report. As to Mr. Price's proposition, that credentials of respectability should be received from members as well as from Fellows, the reason he appeared to support it was that the Fellows were widely spread, and he could quite understand that a country practitioner might not be within hail of any Fellow at all. This would lead to a practical difficulty in getting three Fellows who would honestly certify that they were acquainted with his status in the profession. He was also prepared to second the proposition, that steps be taken to enlarge the area from which Members of Council might be selected, though it was not exactly in the form which he should have liked to have taken. But it would be open to the Council to make application for a charter in such a way as seemed to them to be most conducive to the benefit of the profession at large. Though Mr. Hunting had congratulated them with respect to this particular question, he thought if they could get a larger representation from the country districts, it would be found that a strong feeling of prejudice against the present arrangement existed. As to Mr. Hunting's remarks with reference to the examination, he would point out that no gentleman was anxious to be on the Council; but it was the anxiety of others who thought it would be useful to put him on the Council, and it should be the duty of those who believed in a man being qualified to represent the profession to see that he had a fair chance of getting where he might be useful.

Mr. BURRELL took it that the Council recognised that there was great dissatisfaction amongst the profession in reference to this ninth clause, but it was no doubt true that the profession had only themselves to blame if they did not object to this clause before it was made law. Unfortunately, the profession did not consider the question sufficiently for themselves, but trusted to the Council to take care of their privileges, and, like Samson of old, when they awoke from their lethargy they found themselves shorn of their strength. The Report stated that the Committee appointed by the Council found that they had no power to rescind the clause. Well, that was pretty evident, and need not be discussed any further. Then they went on to say this could only be done by a new charter, and they considered, in the best interests of the profession, that at the present time it would not be advisable to take that step. He thought they might join issue with them there, as there appeared no reason why they should not apply for a new charter, the Council themselves admitting that an injustice had been done. (Hear, hear,

and No, no.) What was the meaning of the appointment of the Committee if that were not an admission that injustice existed? By the passing of this clause members were deprived of the right of sitting on the Council. Why? (A voice, For the good of the rest.) If they could bring themselves to believe that, they might bring themselves to regard the matter with a degree of composure, if not with satisfaction; but that was begging the question. The real evil was that the Council, as it would in future be constituted, would not be a truly representative body. If they wished to have a strong and united profession they must lay a very broad foundation. If they wished the profession to work as one man the privilege of sitting on the Council must be restored.

Dr. FLEMING thought that the charge that the Council of 1876 had acted unfairly was entirely unsupported. Those who were at present agitating could not, he thought, have read the history of the charter. The different clauses of the charter were discussed by the Council, and when it was presented to the annual meeting not a word was said against that clause, though that meeting was largely attended; nor was a word said against the clause by the different societies. The Council were accused of being robbers, knaves, and fools, but those who used these words did not, he thought, know their meaning, and not only that, but they were too careless to inquire into the history of the business. The attempt to throw cold water on the action of the Council of ten years ago was a very foolish one. Nothing was said about it until recently, and the profession had been rather apathetic. He himself did not think that the action of the Council had been at all in the wrong direction, and he was perfectly convinced that unless some stimulus to, and reward for, work were held out the profession would not advance. A member who would not take the trouble to study in order to pass his examination, was not likely to be a very useful member of Council.

Mr. GREAVES thought that in a short time the whole profession would be agreed that the Council had done the right thing.

Mr. EDGAR said this was a day of which the profession ought to be proud, and he hoped it would not go forth that the profession was divided on matters of detail. Having regard to the building in which they were at present assembled, he would ask gentlemen present not to oppose a Council which had done them such good service; this was a poor trumpery matter to have so much discussion about. If a gentleman had the interest of the profession at heart, he surely would not object to taking the only step which would enable him to gain a seat on the Council. (Hear, hear.) The motion for the adoption of the Report was then adopted.

Mr. PRICE'S resolutions were afterwards put to the meeting and negatived by 37 against 25, and 33 against 27 votes respectively.

A member suggested an alteration in the date of meeting from the first Monday in May to the first Monday in June.

The PRESIDENT said the date of meeting was fixed by charter.

Mr. DRAY, in proposing a vote of thanks to the President, said that if anything was wanting to convince the meeting of his assiduity he could refer them to the Report, showing that he had attended six Council and seventeen Committee meetings. But these figures did not denote all the President had done, and the days he had spent in accelerating the finishing of the building. Having as treasurer been much associated with the President, he was bound to say he was a gentleman of unsullied honour and of unquestionable integrity. Before sitting down he would call attention to the very handsome timepiece which their President had presented to them.

Mr. WILSON said he would have much pleasure in seconding the proposition.

Mr. DRAY put the motion to the meeting, and it was carried unanimously.

The CHAIRMAN acknowledged the compliment, and thanked the meeting for having assisted him in bringing the proceedings to so friendly and desirable a close.

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

THE annual meeting of the above Society was held at Lincoln on February 25th. The President, R. T. Hardy, Esq., took the chair, and there were present the following members :—Messrs. W. A. Field (Grimsby), T. E. Smith (Market Rasen), F. A. Holmes (Hemswell), J. Smith (Louth), B. Freer (Uppingham), J. Mackinder (Peterboro'), Capt. Russell (Grantham), F. L. Gooch (Stamford), G. Osborne (Fulston), L. L. Leach (Boston), F. Spencer (Wragby), Treasurer, and C. Hartley (Lincoln), Hon. Sec.

Mr. G. A. Banham, of Cambridge, was the guest of the day, and Messrs. R. Whitton, W. Ashley, and E. Murray were present as visitors. Apologies for non-attendance were received from Dr. Fleming, Professors Robertson and Walley, Messrs. J. M. Axe, J. Hoole, A. H. Brooks, A. H. Santy, T. Greaves, W. Hoole, J. W. Gresswell, and J. B. Gresswell.

As a preface to the business of the meeting, Capt. Russell practically demonstrated at Mr. C. Hartley's infirmary the use of Farmer Miles' instruments and appliances, also the use of the thermo-cautery.

The SECRETARY read some correspondence relative to the election on Council of members of the R.C.V.S., and after discussion, in which the President, Mr. Banham, Capt. Russell, and Mr. J. Mackinder took part, it was unanimously resolved that "This Society pledges itself to join the Southern Counties, the Eastern Counties, the Royal Counties, and the West of England Societies, and to vote for the candidates whom they may select."

The Treasurer's report was read, showing a considerable balance in hand.

Mr. J. W. Gresswell was then unanimously elected as President for the year, and Messrs. F. Spencer and C. Hartley re-elected to the offices of Treasurer and Hon. Sec.

Mr. A. H. Brooks, Long Sutton, was unanimously elected a member of the Society.

Mr. G. A. BANHAM, Cambridge, then read his paper on

THE "EXISTING PRACTITIONER" AND HIS RELATION TO THE VETERINARY PROFESSION,

which formed the subject of a lively discussion.

Mr. President and Gentlemen,—Permit me, firstly, to thank you for the privilege you have conferred upon me in allowing me to bring such a subject as this before you. It may appear a strange one to some of you, and many may think it useless, and unworthy of your attention. But as I have, in the course of my practice, been brought face to face with difficulties which appear to me somewhat troublesome to solve, I take this opportunity of asking you, gentlemen, to give me your ideas upon the subject, in order that we may arrive at some common understanding as to our position with regard to the "existing (registered) practitioner."

It is always as well to know each other's views upon any subject, more especially as they frequently cause us to modify or change our own. Individually, we may often be biassed by personal or other influences, and be apt to take too narrow a view upon matters affecting our neighbours' interest. Still, in dealing with such a subject as this, it is well, perhaps, to remember the motto, "Be just before you are generous."

I propose to consider this subject in the form of answers to the three following questions :—

1. Who and what are "existing practitioners"?
2. What is their position towards the public?
3. What is their position towards our profession?

"Existing practitioners" belong, as you are all aware, to various callings and positions, in which they have been more or less engaged in the treatment of animals in some form or another. During such occupation, they probably have had some of the animals under their care unwell and then tried their hands at getting them well again, in which they perhaps succeeded. After a few such trials, they would naturally consider themselves competent to undertake a similar office for their neighbours, until, eventually, they no doubt found their services were so often sought after, that they found little time for any other consideration. They therefore devoted the greater part of their time to this work, under one or other of the titles then in vogue, each according to their own sphere.

This, then, is the obvious origin of "horse-doctors," "cow-doctors," "dog-doctors," etc., for even in the present day many of them start and rise in the same manner.

1. Who has not seen the "horse-dealer," "trainer," "groom," or "shoeing-smith," who would venture an opinion upon anything connected with a horse, and who considered himself quite competent and willing to undertake the "cure" of nearly any ailment the horse is heir to?
2. So also do cattle-dealers, herdsmen, and even drovers, with regard to the diseases of cattle.
3. Shepherds, to a man, consider themselves adepts in treating the diseases of sheep; in fact, if they do not, their employers do not consider they know their business.
4. "Pig-dealers" are usually "pig-cutters," and are ever-ready advisers when anything is amiss with their customer's pig.
5. Dog-dealers usually consider themselves second to none in curing the diseases of their fancy; and they usually couple with it the diseases of cats.
6. Some chemists, and a few from other branches of trade, start in the line.
7. Sons of either of the foregoing, who started life in some other occupation, but who, at their father's death, leave it to follow their deceased parent's calling without ever having had any training beyond the recipes of the nostrums their fathers used.
8. There is now in existence yet another class of man, who busies himself very much about the ailments of animals, not only with reference to the pain they cause the creature, but also with regard to their "cure" or "relief." I mean the inspectors acting under the various societies for the prevention of cruelty to animals, who take advantage of their office for this purpose.

In addition to these "non-trained quacks," if I may so term them, there are others who have had what may be called a "training"; for instance, we find.

1. Sons of the above-mentioned classes, who have been brought up under their parents' guidance, and who have, for perhaps years before their parents' decease, acted as their assistants.
2. Persons who have been assistants, in the shape of "dispensers," "dressers," "agents," and so forth, to qualified veterinary surgeons. In this class we may include the ex-farrier-majors from the army.
3. Those who commenced their studies with the intention of entering our profession, but who were unable to pass the examinations—some of whom had previously studied under veterinary surgeons. I may here remind you, gentlemen, that many of this class were debarred in the time when our Council allowed a student three trials to pass the examination. Happily, this no longer exists.

4. Last, but not least, are those students who intended to enter our ranks, and who successfully passed one or two of their examinations, but were prevented from continuing their studies at the schools, and obtaining their diplomas, by some unforeseen circumstances over which they had no control.

From the foregoing you will see that the majority of the present "existing practitioners" are persons who have assumed a position under false pretences; since none of those I have termed "untrained" can have any satisfactory knowledge of what they are doing in cases of disease in the lower animals. They neither know the structure of the animal, the nature of the disease, nor the action of the remedies they use.

The same remarks apply to the first-named of those I have termed "trained"; for their training has been given them by persons who are themselves incompetent of giving any training at all, in the real sense of the word.

The second class may be said to have had a training in special work, but under no circumstances can they be considered fit persons to have the care of sick animals wholly under their charge, although many of them are good assistants (during operations) and nurses under the guidance of a veterinary surgeon.

The third class are evidently men of low educational calibre, and unable to grasp the subjects they chose to study; or perhaps they were lazy and indolent students, taking their pleasures and spending their energies in other employments, which, if they would follow instead of that of the study of veterinary medicine, might furnish them with a fair field for success.

The fourth class of men are certainly worthy of our consideration, and well deserve our sympathy and assistance, and are entitled to all that can be conceded to them by the public and the profession.

So much then, gentlemen, for the various classes from which the "existing practitioner" has been derived. If there are any other such which I have omitted, or not fully described, some of you, I dare say, will supply the omission.

We will now pass on to consider *the Relations of the "Existing Practitioners" to the Public.*

When we look back and see that veterinary surgery has only existed as such in this country for ninety-five years, the question naturally arises, what did the public do for assistance to their sick animals before that time? Why, got it when, where, and from whom they could, and no persons were more likely to be appealed to than those who had the charge of them in health. Hence the old adage, "To know disease, we must first become acquainted with health." The more fortunate and successful of these men after awhile began, as a Newmarket man would say, "to fancy themselves," until eventually they gained a reputation, and followed the calling for a livelihood. The same kind of thing has been going on, more or less, ever since, especially in districts where educated veterinary surgeons did not settle down to practice.

In 1863, as the editorial in Vol. 14, p. 112, of the VETERINARY JOURNAL points out, the number of members of the Royal College of Veterinary Surgeons was comparatively small (less than half what it was in 1885), so that several districts in England were unprovided with qualified practitioners. The inhabitants of such districts were naturally grateful for any assistance they could obtain in time of need. I maintain, therefore, that the public in such districts owe these self-made animal doctors a debt of gratitude—for no doubt they rendered the best services they could to the public when no other could be obtained, and no one could do more than their best under any conditions. Therefore, these men deserve the esteem, the gratitude, and the protection of the public.

Of course the foregoing only applies to the times and places when edu-

cated veterinary aid could not be obtained. In those places where good and honest qualified practitioners reside, what do we find? Why, that any "shoeing-smith," "pig-cutter," "castrator," or "groom," undertakes to treat animals in disease, and the public employ them, not because they believe they are more competent and skilful than the qualified practitioner, but simply because their conscience (?) is easy, as something is being done, and that, too, at a cheaper rate than a qualified man would charge for it. The cases that are placed in these men's hands are usually simple ones, and they get well. This gives them the confidence and assurance so characteristic in this class of men. They then begin to play upon the public with their tongues and nostrums, and find it pays. Now, what claims such men have on the public I am at a loss to know. The public have far greater claims on them; the public owe them nothing, they owe much to them. However much the public may owe to those men who helped them when they could not help themselves, they owe nothing to those quacking charlatans who reside in districts where educated assistance could be had if the public chose to ask for it. And it appears to me that the sympathy these men received from the Privy Council was quite as unjust as were the reproaches lately bestowed upon the unemployed when a lot of rogues and thieves took advantage of their gathering to plunder, pillage, and destroy personal property in the West-end of London.

We will now pass on to the third and most important part of the subject, viz., the Relation of the "Existing Practitioner" to Members of the Royal College of Veterinary Surgeons. It has been said "that the cow-leech, farrier, and the emasculator were the fathers of our profession." If this were so, it might be supposed that they were entitled as such to our respectful consideration. However, I, for one, beg respectfully to differ from this view, inasmuch as I do not believe that the foundation of veterinary surgery is in any real sense due to this class of men. They neither studied nor tried to improve the treatment of animal diseases, and no such thing as veterinary medicine or surgery existed, either as a science or art even, except, perhaps, in a few single individual minds, before a Frenchman named Charles Vial de St. Bel started our Veterinary School in London in 1791, who, in my humble opinion, was the father of veterinary science in this country. We cannot deny that practitioners existed, but I do not know that any of them ever assisted in founding the teaching school.

Nevertheless, I think that each one of us will admit (and I believe many of the "existing practitioners" themselves even would) that they owe much to us. How many of us are there that, at one time or another, have not given them some little hint, some caution, some recipe—ah! and even performed operations for them free of expense, etc. As a proof of this, I will, with your permission, quote a little anecdote that happened in my own knowledge.

A retired qualified practitioner, residing in my district, used (when in practice) to be frequently called in by a farrier, living some eight or nine miles away, to assist him out of some difficulty or other, or to perform some operation which he did not consider himself competent to undertake. This state of things existed amicably enough for several years; and when Cattle Plague was in this country, the qualified practitioner had so much to do that he recommended the farrier to be appointed his assistant in the district where he resided, which was acceded to by the Executive Committee. This appointment naturally introduced the farrier to many men he did not know before, and really gave him a standing in their estimation, and he used his appointment as an influence to extend his practice, and succeeded in doing so; every now and then calling in the aid of his old friend, although not so often as in former years—in fact, he began to have more confidence in himself, and so could dispense with his adviser. On one occasion, however, the

qualified practitioner asked him what he administered to animals suffering from a certain malady, which he had of late been rather successful in treating. The quack answered, "Ah! that is a secret, and if I tell it to you, you will be as wise as I am." This rather staggered the veterinary surgeon, after what he had done for the man. The result you can imagine; he never met him again on the same terms as before. However, this made no difference to the quack, as he had got sufficient information from his qualified friend to answer his purpose, and was, as he termed it, "independent of him now." This, gentlemen, is an example of the men that are "registered practitioners," and the treatment we may expect from them. All that I will say is that this should be a lesson to all of us, as it undoubtedly was to my friend, who related the story to me.

I must apologise for using such personalities, but trust the inference to be drawn from it is not unworthy of your consideration.

Well, gentlemen, to resume my text. The "farrier" and "cow-leech," etc., were quite content with their position, and were men of meek and humble minds, until St. Bel began to send forth his pupils to the world as "*Veterinary Surgeons.*" It is true they were only taught the elements of the science; still, they began to make their stand before the public, and became appreciated by them. When the farrier and cow-leech saw this, some of the more audacious began to assume the title of "Veterinary Surgeon" themselves, although the majority, be it remembered, were content with their own special titles and descriptions.

This state of things existed until the veterinary surgeons obtained their Charter in 1844, which was intended to give its members the exclusive privilege to use the title of "Veterinary Surgeon." However, it was found, as Dr. Fleming expressed it, that a Charter does not constitute a law, but merely confers privileges, which, again, have to be protected by Act of Parliament. This protection our Charter never received, and therefore those who assumed the title "Veterinary Surgeon" were not acting unlawfully. Thus we proceeded until 1863, when our Council began to stir itself to think about getting a "penal law," and they thought well, for their deliberations lasted until 1867. But the thought was stillborn, and these charlatan practitioners still had the privilege of styling themselves "*Veterinary Surgeon*"; and it continued until 1881, when the Veterinary Surgeons Act became law. But we must also remember that, although the empiric could legally use the title, still very few of them availed themselves of the privilege until after the Act was passed, which was a means of enlightening them on the subject. The Act is so fresh in all your memories, that I am sure I need not draw your attention to any of its clauses. It not only taught unqualified persons that they could use the title "Veterinary Surgeon" without legally offending anybody, but also that we had no exclusive right to it; and, moreover, that we could not hinder anybody who wished to register from doing so. Although several of our members considered it was, and ought to be, our own special title, still, as has been before said, "The more reasonable members never expressed a wish for more than that the public should be able to distinguish between qualified and unqualified practitioners;" and this the Act accomplishes by requiring that they shall have separate and distinct registers—the unqualified being registered under the head of "Existing Practitioners." This distinction confers no benefit or privilege upon them beyond what they possessed before the Act was passed, except so far as it protects them from the penal operation of the Act as applicable to unregistered persons.

From this it will be seen that since 1881 every person who has registered has a legal right to use the title of "Veterinary Surgeon," and why should he not? The title never was ours by law, and therefore we have no exclusive right to it, although many of us were under the delusion that we had. If our

forefathers were so remiss as not to legalise it, we have received our reward—viz., their sin has fallen upon us, and now we must bear it with as good grace as possible.

One more word about our Act, and we will pass on. Although it did not embrace so much as some would have wished, still I believe most of us now believe that we obtained all that we should have ever expected, and certainly all we could reasonably ask for.

Previous to the passing of the Act these persons could not only have usurped our title (Veterinary Surgeon), but also our "letters" (M.R.C.V.S.), as no law existed to prevent this assumption, and therefore no illegality could be laid to their charge (VETERINARY JOURNAL, Vol. 16, page 102).

Now, gentlemen, bearing these facts in mind, what are our relative positions after the Act has become law? There is no doubt the list of "existing practitioners" contains the names of many worthy common-sense men, especially those gentlemen who in their younger days studied under graduates of the R.C.V.S. and afterwards passed through part of the college curriculum. Such men (as was mentioned above) should receive sympathy and assistance in every way. On the other hand, we must admit (if the various reports are true) that a large proportion of them are illiterate, conceited, self-confident quacks (in its literal sense), and several of them should never have been placed on the register at all had we been fairly treated.

Nevertheless, I suppose we must be content with the fact that if any "have procured registration by means of false statutory declaration, they are liable to a heavy penalty at any time, and to the removal of their names from the register, while those who aided them by certificates are equally liable to punishment." This looks all very well in black and white, but when any of us wish it to be put into practice, we find there are many stumbling-blocks in the way of our doing so.

Now, gentlemen, I will ask this meeting to discuss, firstly, *What are the best means for obtaining justice with regard to offenders against the penal laws of the Veterinary Surgeons Act?* I would remind you that the Act says in Clause 19, that "A prosecution under this Act may be instituted by the Council of the R.C.V.S., but shall not be instituted by a private person without the written consent of the Council." This, I think, is important to be borne in mind when discussing the subject. Personally, I should like to see a fund for the purpose started, and placed in the hands of our Council for them to prosecute, under the direction of their solicitor, in all cases of offence against these laws. I do not think the responsibility of prosecutions should be left to individual members at all, although certain cases may be primarily annoying and detrimental to individual members. Still they are really detrimental to the profession at large, and should be dealt with by the profession in its associated capacity.

The next question I would ask your opinion upon is, *Whether "existing practitioners" are responsible for their actions in the eyes of the law, now they are legal practitioners?* I should say they ought to be. If the law says (or infers) they are competent persons to undertake such duties for the public, the latter ought to be able to recover damages, should they suffer any loss by such practitioners, especially as the Privy Council ruled that our Council ought not to inform the public that "*As these persons (registered practitioners) have not undergone the qualifying test prescribed by the R.C.V.S., the Council do not hold themselves responsible in any way for their professional qualification.*"

Another question I will put to the meeting is, *Should "existing practitioners" be employed as veterinary surgeons under the Contagious Diseases Act?*

I cannot help thinking they should not; not because they have no right to

such practices, for I believe they have a legal right to any and all the practice they can get. Nevertheless, when public money is being spent, the public themselves have a right to insist that the spending of it should be entrusted to the best possible men, and no others. Therefore, they should appoint properly-qualified men to act under them to ensure this. Moreover, I think, when a person has gone to the expense and trouble of educating himself in all the details of a profession, he, as one of the public, has a claim upon them before another who has done nothing for himself or the public, except set himself up amongst his friends as a person who knows all that is required to fill the post. Appointing the latter not only discourages a very useful public profession, but it also seems to me unjust to the public themselves.

The last and most important question, and the one upon which I especially wish to elicit the opinions of the meeting, is, *Whether we should meet existing practitioners in consultation, and, if so, upon what terms?* My views upon this subject are already before the profession (VETERINARY JOURNAL, Vol. xxi. p. 115), but I will again state them here, as an opening to a discussion. In considering this question, we must not forget our position to the public, the patient, and the profession, as well as the practitioner himself.

As we are in duty bound to serve the public faithfully whenever called upon to do so, as also to relieve a suffering animal if we possibly can, I do not think we can honestly refuse our services, even if asked to give them by the "existing practitioner" himself; much less ought we to think of doing so if his client should ask us.

Well, if this is so, how should it be done?

Whether the client or the practitioner himself call us in, it matters not. We should, if possible, see the latter in both cases, not only as a matter of courtesy, but to find out what has been done, so as to enable us to arrive at a correct opinion. After we have heard his explanation and line of treatment, and made our examination, we can then name the disease the animal is suffering from, and proceed to give our directions as to the administration of remedies, which should, in all cases, be prepared by ourselves, and not given by word of mouth or in the form of prescription to the "existing practitioner" in attendance. Under no conditions should we inform him of the nature of the medicine we intended to use, nor of the reasons for our treatment. This is not only unnecessary, but harmful to the profession, and especially—as too frequently happens—the "existing practitioner," although there may be a properly-qualified veterinary surgeon, will generally be found to call in the aid of one residing out of the district. In this case, then, any knowledge we may impart to him will be acquired not to your detriment so much as to some other brother veterinary surgeon, and, if we instruct him, we are doing an injustice to the qualified man.

On the other hand, we should never take the case out of their hands, but leave it for them to watch and report from time to time. We can continue to send medicines for the "existing practitioner" to administer, as we may think necessary; but we should never call a second time unless specially asked to do so, unless there is some previous understanding with the practitioner in attendance. Otherwise they may think we are endeavouring to take the case out of their hands.

If this line of treatment is followed by all of us, I think there will be little cause for any complaint from brother veterinary surgeons residing in the district, and if the "existing practitioner" thinks such treatment unfair and hard, it cannot be helped. I am perfectly convinced we ought not to do more for them than this, and they ought not to expect it of us, except, perhaps, those who have been to college and passed some of their examinations. In such cases we can talk over and reason out the case with them and leave it

entirely in their hands—in fact, treat them as we should one another. This line of meeting "existing practitioners" is based upon the fact that we cannot consult with men who have no real scientific knowledge of their case or of the medicines they use; where such fundamental knowledge is wanting, there can be no consultation in the proper sense of the word; secondly, that it is unfair to brother practitioners living in the district; and, thirdly, that it leads the "existing practitioners" to suppose they know more about such matters than they do, as the case cited above proves. Our duty is not to assist them, but to assist the owner and relieve the patient.

I could say, perhaps, more in detail about the subject, but I trust sufficient is before you to form a basis for discussion, which I now invite.

Perhaps it may help to give a definite form to the discussion if I briefly repeat the headings under which the questions have been formulated :—

1. How shall the penal clause of the Act of 1881 best be put into force?
2. Do you consider that "existing practitioners" are responsible for their actions in the eyes of the law?
3. Should they be employed as Veterinary Inspectors?
4. Should we meet them in practice, and, if so, on what terms?

To this may be added another question, sometimes mooted, as to our admitting them to our professional societies. I think, however, this hardly needs any comment from me, further than that I cannot see how we can admit them there any more than that we can consult with them about disease and medicine. If we do one we might very well do the other.

After a hearty vote of thanks had been passed to Mr. Banham for his important paper, the members and friends dined together at the Albion Hotel.

Grimsby was selected as the next place of meeting.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 353.)

Habitat.—Between the mucous and muscular walls of the stomach, in which situation they cause the production of trabeculated tumours, or abscesses, from an inch to an inch and a half in diameter, which usually contain more than one parasite; some of these growths may be observed in which no worm exist, they having passed out into the cavity of the viscus through the holes which are seen penetrating the structure in a transverse manner. They are more common in old than in young animals. Although not regarded by veterinary surgeons as of great importance clinically cases have been recorded where their presence has apparently been attended with serious results. One fatal epizoöty is recorded as having occurred amongst mules in the Mauritius in 1876, which, by competent authorities, was attributed to this entozoön.

6. *Spiroptera microstoma.*—Small-mouthed maw-worm.

Form.—Very much resembling the preceding; the mouth is, however, smaller, almost square, and instead of four prominent labial protuberances, there are only two, with some differences in the caudal papillæ. In length they vary from 12 mm. to 18 mm.

Habitat.—Free, in the gastric cavity.

7. *Strongylus Axei.*—This name has been given by Dr. Cobbold to a very minute worm, about 5 mm. in length, regarded, from its caudal bursa, as belonging to the genus Strongyles, first observed and noted by Professor Axe in the stomach of the donkey.

The animals in which this parasite has been found were aged animals, but as yet no clinical symptoms have been indubitably associated with their presence.

Habitat.—Although somewhat resembling the *Spiroptera macrostoma* in its close relationship to the walls of the stomach, it is so far unlike it that no tumours or elevations exist in which it resides, but it is merely located under the surface of the membrane itself. In some cases which I examined there were scattered over the mucous membrane of the gastric portion around the pylorus numerous spots, slightly elevated or indented, as if the mucous membrane had suffered erosion or irritation, ending in exudation. These spots varied somewhat in size, from a third of an inch in diameter to irregularly-margined tracts larger than a florin, The edges were slightly raised, not unlike a ruptured vesicle from a burn. Gently scraping these parts, and examining the material removed, disclosed the presence of numerous nematode worms, very slender, but of considerable length.

Symptoms and diagnosis.—With the nematode, as with the previously-mentioned tapeworms, their presence in the intestinal canal is only attended with disturbance sufficient to attract attention when they are numerous, or when the host is operated upon by other adverse and unfavourable influences. Occasionally they give rise to congestions, inflammations, or textural changes, of an ulcerative or necrotic character, over the portions of the canal which they inhabit. In rarer instances they may produce obstruction of the bowels, through their numbers or association ; or dangerous and complicated symptoms may exhibit themselves from migration into near or more distant organs.

The symptoms ordinarily connected with their presence are such as may be referred (1) to *local irritation ;* (2) *reflected disturbance ;* (3) to *general functional disorder.*

The local symptoms are abdominal irritation and pain, capricious or depraved appetite, in which unnatural materials are greedily devoured, foul breath, and an irregular character of the intestinal discharges. Many cases of what are termed Colic owe their existence to disturbance occasioned by intestinal worms, and are only successfully treated when the existence of these is taken into consideration.

The chief reflex phenomena are itching or irritability at the mucous orifices, evidenced by rubbing the tail and points of the hips, curling of the upper lip and rubbing of the nose, with, more rarely, a drowsy lethargic condition, muscular tremors, or serious convulsion fits.

The general disturbance includes wasting or marasmus, notwithstanding, often, a rather large appetite; fatigue out of proportion to the work undergone ; a dry, unthrifty condition of the skin, with loss of sprightliness and vigour.

All these symptoms may exist, and the question may still require to be determined how far these are dependent on the existence of parasites. The diagnostic indications are the passage of the worms, portions of these or their ova ; and, with this object in view, when such symptoms as we have mentioned present themselves, it is always desirable that the discharges from the bowel be submitted to careful examination, in order that our diagnosis may be placed beyond mere speculation.

With the large ascarides, when their numbers are considerable, it is not an uncommon feature to have recurring attacks of indigestion and abdominal pain, while wasting of flesh continues in spite of a large consumption of food.

In cases of invasions of the palisade worm, in addition to similar attacks of disturbance attributable to abnormal conditions of the intestinal canal, we not unfrequently encounter varied trains of symptoms of an occult character, unaccounted for by other changes, and probably the result of injury inflicted by the parasites in their migrations in different parts of the body, the particular class of symptoms being attributable to the special organ or structure invaded.

From the presence of the *Tetracanthus strongylus*, symptoms of serious intestinal disturbance are more likely to be encountered than with the other helminths. These parasites are largely found in young, ill-thriving, and indifferently-fed animals, and where the pastures are of an inferior and rank character. It is very probable that the unthrifty character and want of flesh which these subjects exhibit is more largely the result of the parasitism than its cause.

From the individual character of these helminths, and the situation which they occupy in the intestinal walls, the irritation associated with their presence is usually of a chronic character—at first not very attractive, but always of a serious nature.

The most attractive symptoms—and, apart from the detection of the worms themselves, the most diagnostic—are distinct and increasing marasmus, with a shaggy condition of the coat, pendulous abdomen, feebleness and exhaustion in being put to active exertion, together with recurring persistent and fatal Diarrhœa. Even a moderate number of these worms, I have found, induce intestinal irritation and textural changes, sufficient to permanently invalid horses, and render them an easy prey to unfavourable influences with which they may be surrounded.

Where the *Oxyuris curvula* exist in numbers sufficient to disturb, the most characteristic features are the local irritation at the anus and nostrils, with a dry, unthrifty condition of the skin, depraved appetite, and collections of orange-coloured pasty material, their eggs around the anus.

Treatment.—When satisfied that any of these varieties of worms exist in the intestine, means must be adopted to destroy or expel them, through the use of such agents as experience tells us possess vermifuge properties. With nearly all, save the *Tetracanthus strongylus*, during its lodgment in the intestinal walls, this may be carried out with reasonable hope of success. With the large *ascarides*, the *palisade* worm, and the *oxyuris*, from one to two fluid ounces of oil of turpentine, administered with a pint of gruel, mucilage, or oil, for one or two mornings in succession, and followed on the third by a moderate dose of aloes and calomel, will be found successful. Santonine, in half or whole drachm doses, made into powders with linseed meal, and given for two or three mornings consecutively, and followed with a laxative, as in the case of the oil of turpentine, is also efficacious. It possesses the advantage that, from its nearly tasteless character, it is usually taken readily in the food. Pure carbolic acid, one drachm, combined with an ounce of spirit or glycerine, and exhibited in water or gruel, has been found beneficial in causing the death and expulsion of all nematode worms. This draught may be repeated, like the terebinthinate mixture, and, as with all vermifuges, is advantageously followed by the employment of laxative agents.

Besides these individual vermifuge agents, I have found that a most efficient ball may be compounded of Pulv. antim. tart., ʒiss.; Calomelas, gr. xxx.; Ol. filic. maris et Ol. sabinæ, ā.ā., M. 60; Pulv. zingiber., ʒj.; Tereb. Venet., q.s., or Pulv. aloes Barb. ʒi-ʒij.; Calomelas, gr. xxx.; Antim. tart., ʒi.; Pulv. santoni. et Pulv. zingiber., ā.ā., ʒj.; Treacle and linseed meal, q.s. Either of these may be given two or three mornings consecutively, and should purging not occur after the second or third ball, an ordinary laxative ought to be administered. In many cases it will be found that the second ball nauseates and causes purging, in which case a direct laxative must be withheld. Where the *Oxyuris curvula* is the disturbing parasite, in addition to the administration of medicines by the mouth, benefit will often be derived from the employment of an enema, seeing the entozoön is located in the posterior bowel.

The fluid used may be simple water, or a solution of common salt or perchloride of iron, or infusion of tobacco, gentian, or quassia. The use of

this enema to be persevered in for some weeks, two or three times weekly; and it is advantageously combined with the employment of sulphate of iron as a general tonic having vermifuge properties.

When, from the discharge of the *Tetracanthus strongylus*, in any form, we feel satisfied that the state of continued ill-health or intestinal disturbance is owing to the location of these in the intestinal walls, great care is needful that any vermifuge we exhibit may not aggravate the condition of local irritation already existing. We may cause ejectment of the worms when in the lumen of the bowel, but we have little power over those encysted in the bowel tissues. With the exception of an occasional dose of laxative medicine, more benefit is likely to result from careful regimen, good stable-management, and pure tonics. These latter, in the form of sulphuric acid and sulphate of iron, or of acid with quinine, or liquor arsenicalis, may, with intervals of rest, be continued for months.

Such medicines as these, with attention to diet and proper sanitary conditions, and, as already stated, occasional doses of a mild laxative, are more likely to be beneficial than any irritating agents.

In all cases, even when the agents employed are acting in the destruction and removal of the parasites, every attention ought to be bestowed in attempts to fortify and strengthen the system both by correct diet and the use of tonics.

With the employment of means to remove the worms, and generally to improve the health of our patient, care will require to be exercised to prevent reinfection of the patient or the propagation of the parasites to others yet uncontaminated.

This prophylactic treatment is to be secured by the removal and destruction of all ejected parasites or excrement containing these or their ova, so that, neither directly or indirectly, through food, water, or stable utensils, there shall exist a chance of these entering suitable hosts.

Notwithstanding the employment of all these means of a directly curative, supporting, and preventive nature, it must not be forgotten that, where the offending parasites are possessed of wandering propensities, there is always the possibility, or rather probability, that symptoms of an entirely different nature from such as are ordinarily connected with the presence of these organisms in the bowel are liable to crop up, and that such are liable to vary in accordance with the tissue or organ invaded.

These untoward conditions will necessitate treatment in accordance with the symptoms developed and the organs attacked, not instead probably, but rather in addition to those directed to combat the intestinal Helminthiasis.

The PRESIDENT said they had listened with very great pleasure to the interesting paper which Professor Robertson had just read to them, and, as the time at their disposal was now short, he thought it would be well to adjourn the discussion on the paper to the next quarterly meeting.

Mr. H. HUNTER said they could not do better than adopt that suggestion. If the members had an opportunity of reading the paper before the next meeting, they would all be prepared to take part in the discussion.

Professor ROBERTSON: I may not be able to be present at your next meeting. If I can, I will.

Mr. D. DUDGEON proposed a cordial vote of thanks to Professor Robertson for reading such an instructive paper.

Mr. PEELE seconded the vote of thanks, which was unanimously agreed to.

Mr. H. HUNTER proposed a vote of thanks to the President.

Mr. A. CHIVAS seconded the vote, which was agreed to.

Mr. D. DUDGEON moved that the President's address should also stand over for discussion at the next meeting. The address contained many things which might be profitably discussed.

The motion was agreed to.

The annual dinner was afterwards held, under the presidency of J. B. Nesbit, Esq., and was largely attended by members and their friends. A number of veterinary topics were discussed, several songs given, and a most enjoyable evening spent.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

A SPECIAL meeting of the above Association was held at the Blackfriars Hotel, Monday, April 5th, 1886.

Present:—Messrs. T. Briggs (President), Peter Taylor, Thomas Greaves, W. Whittle, W. Woods, Sen., James Howell, John Lawson, A. Lawson, T. Hopkin, W. Taylor, A. M. Michaelis, S. Locke, S. Horrocks, W. Dacre, A. New, J. B. Taylor, J. B. Wolstenholme, A. Leather, J. Storrar, J. Faulkner, J. Dixon, and Jno. Ingram.

The SECRETARY reported that, acting on resolution of March 10th, he had written the Secretary of the Midland Association, desiring to know if their nominee (Mr. Perrins) would pledge himself to vote for the repeal of the 9th clause.

The reply which had been received came before a meeting of the Election Committee, held March 29th, and in the opinion of which Committee it did not meet the requirements of the resolution referred to.

Under these circumstances, the President had convened this special meeting to take the opinion of the Association on the subject.

After considerable discussion, during which several propositions were made and negatived; it was resolved to adhere to the original resolution of March 10th, that we co-operate with the Liverpool and Yorkshire Associations, but not with the Midland, as the policy of their nominee was not in accord with the above resolution.

The PRESIDENT gave notice that at the next quarterly meeting he would resign his office, and give his reasons for so doing.

Mr. GREAVES tendered his resignation as a member of the Association.

A vote of thanks to the President concluded the meeting.

JAMES W. INGRAM, *Hon. Sec.*

THE WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

A MEETING was held in the Veterinary College, Glasgow, on the 5th May. The President (Mr. Anderson) occupied the chair. Sixteen members were present.

Mr. POTTIE, Paisley, described some cases of Scrotal Hernia, which he had successfully treated by means of a truss designed by himself. He showed the truss and explained its application.

At the request of the Society, Mr. POTTIE consented to exhibit the truss at the Edinburgh meeting of the National Veterinary Association.

Mr. WEIR, Glasgow, showed a fine specimen of a fractured navicular bone.

The CHAIRMAN asked the members to examine some parturition instruments invented and sent by Mr. P. M. Walker, M.R.C.V.S., Halifax.

Mr. NUNN, F.R.C.V.S., A.V.D., was elected a member of the Society.

The PRESIDENT intimated that Mr. Campbell, Kirkcudbright, had promised to read a paper at next meeting on Parturient Apoplexy.

J. MACQUEEN, *Secretary.*

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 378.)

Anatomical Characters.—Besides the usual alterations in form from the unnatural curvature of the shafts, when this exists, and the enlargement of the epiphyses in all, rickety bones are unnaturally soft, in many instances being capable of being cut with a knife, while the periosteum is thickened and vascular. The most marked changes are, however, at the epiphyses themselves, the cartilage of development and the periosteum covering these. Over the whole expanded articular extremity, and particularly in the area of the cartilaginous development, in the young or growing bones the process of proliferation and delayed ossification is well marked. In this latter situation, recognised by the naked eye, in the normal state, by a well-defined blue line, there seems great activity, and it is unnaturally extended. The abundance of the cell growth does not, however, seem, as in the normal condition, to possess a definite arrangement: centres or nuclei of ossification may be observed, at different levels, both in the blue zone and extending beyond it, cartilage cells mingled with osteo-blasts; but there is no regular advance of the ossifying process, no well-defined medullary spaces; the entire bone structure of the extremity is opened out and rarefied, the medullary cavity extending beyond its normal limits, and the extremely-developed cancellous structure containing numerous spaces, which, with the rarefied bone tissue and medullary canal, are filled, particularly at first, with a reddish pulp, composed of fat. nucleated cells, and blood corpuscles. Under the periosteum, the other seat of bone growth and development, we observe the operation of a process somewhat similar to that noticed as existing in the epiphyses; the sub-periosteal layer is increased in thickness and vascularity, and there is great preparedness for ossification, without its accomplishment. Instead of dense, compact bone structure, fitted for increase of the shaft, it is granular and soft. The fibrilated tissue which passes, or ought to pass, into the shaft does not undergo ossification, so that the entire bone structure is represented by a thin layer of osseous matter imbedded in much softer or simply fibrilated matrix. When recovery takes place, a change occurs, for the lime salts are deposited in this matrix, but not in combination, as in health, and the result is rather calcification than ossification.

In the cases of lambs, the anatomical characters which are encountered are extremely interesting; for, although not situated in similar parts of the skeleton, they illustrate and explain the different symptoms which these animals exhibit when suffering from this disorder of bone nutrition. In noticing the symptoms, it was observed that with lambs the distinguishing were motorial disturbance and perfect paraplegia, and that rarely were the bones of the extremities affected, as in many other young animals.

Carefully examined, neither the bones of the limbs nor the visceral organs afford evidence explanatory of the symptoms exhibited during life. With these cases of rickety lambs, it has been stated that examination showed evident changes in some parts of the central nervous system. These, it is stated, are more particularly observed in the spinal canal and cord. In the cavities of the coverings the normal quantity of fluid is said to be increased, while changes of a varying character, it is stated, have been noted in the intimate nerve elements. That both these conditions may be seen, I feel satisfied; that they are invariably well marked, I do not believe. The former I have noticed with more constancy than the latter, which, save in rare and prolonged cases, I have never been able to satisfy myself existed. Of more importance, however, probably, than changes of a doubtful character, which may be made out in connection with the intimate structure of the cord, are

alterations in the bone elements which form the canal in which the cord is lodged. Here it is well to recollect that, in growing bones, each individual vertebra, in its body, is made up of three sections—a central portion and two epiphysial plates, each plate united to the centre by an intervening disc of cartilage. In healthy bone these plates are merely thin, clear lines. When Rickets develops, however, the same cell proliferation occurs here which was noticed in the epiphyses of long bones, the soft and rapidly-growing tissue bulges and projects into the canal. With an average amount of care in conducting an examination of the cord and vertebral canal, it will, in the majority of these cases, be clearly enough be made out that any changes observed in the cord are more likely to be the result of pressure, proceeding from changes of form in the bony canal in which it is lodged, than from alterations in its intimate structure. When making this examination, it is better to carry out a longitudinal section of the bony column throughout the canal than to lift the roof by dividing the arches. When thus divided, a little examination will disclose the fact that in many instances the cord exhibits portions more or less restricted, these constrictions being opposite the union or articulations of the vertebræ. The cause of this regularly-distributed, but interrupted constriction is, the uneven condition of the floor of the canal, from the swelling of the epiphysial cartilaginous plates; the ultimate result being to produce pressure and constriction of the contained cord, with, probably, increase of fluid in the cavities of the investing membranes. This swelling of the individual extremities of the separate portions of the vertebral chain is dependent on the imperfect bone development incident to a general state of malnutrition. Thus, in these very young, the local evidences of the general disturbance are chiefly confined to the bone elements constituting the spinal column; in other animals, and in older of the same species the lesions show themselves more in the passive organs of support, the bones of the limbs.

This particular invasion of the bones of the spine in lambs is an exact counterpart of what has been observed in several species of wild animals retained in captivity, both at puberty and in early life.

A detailed account of this condition of these animals, by Mr. Bland Sutton, may be found in the *Journal of Anatomy and Physiology*, Vol. XVIII. In this contribution to comparative pathology, carried out through a very large number of after-death examinations of different species of animals, Mr. Sutton arrives at the conclusion that half the animals kept in captivity in this country die from Rickets; that the proportions in which the local lesions are encountered in the axial and appendicular parts of the skeleton differ less in the different species than they do in the same species at different ages; also, that in very early life, in all, the probabilities of the long bones of the limbs being largely invaded are greater; that, after puberty and in adult life, the proportion in which the changes are observed are reversed.

2. *Fragilitis Osseum, vel Mollities Osseum.*—I will not detain you with attempting to prove either the identity or non-identity of the conditions which have been recognised by these terms, nor to make an endeavour to prove that both are merely forms of Rickets modified by the modification of the normal physiological processes attendant on age.

If not identical with Rickets, they are closely allied to it, as perturbation of bone nutrition, while I think I may be able to show, when we come to speak of the etiology of these conditions, that in sheep, at least, they are intimately related, if they do not arise from precisely the same extrinsic causes.

Although bone-softening and fragility, as a constitutional disturbance apart from inflammatory action—whether we regard these as affections *sui generis*, or merely as Rickets of adult life—have probably a less extensive record, and have attracted less attention than what is *par excellence* regarded as Rickets, there is yet no reason to doubt their existence in all animals.

The parts of the skeleton where these changes are more particularly observed are the long bones of the limbs, and the subjects of attack are ordinarily animals at maturity, or which have reached adult life.

Anatomical Characters.—The most distinctive, or, indeed, only obvious, structural changes are in connection with the bones of the extremities. These, both in their intimate structure and covering membrane, give to the ordinary observer the idea of increased vascularity. There is not, however, as in ordinary Rickets, any increase of bulk or extra development of the extreme ends of the bones; nor are the changes greater at the junction of these with the shaft, even when perfect ossification has not been completed. The outer shell of compact tissue is less marked by softening than by unnatural thinning, the medullary canal being of greater capacity, and the open tissue increased. Extending into the interstices of this tissue, and through the medullary canal, is abundance of soft, reddish pulp, largely made up of fat globules, nucleated cells, and blood corpuscles. This material, while extending into the extreme ends of the bones, does not induce any evident increase of bulk in these parts. The articular cartilages, although not destroyed, seem thin, and are spotted over their centres with darker-coloured markings. These look as if removal of structure might follow, but ulceration I have not met. The bones, as a whole, are not disposed to bend or alter in shape, but, from their thin and vascular condition, are very liable to fracture under trifling exertion. The periosteum is thickened throughout its entire extent, the under layer of active cells seems engaged in a formative process somewhat similar to what is observed in bone formation. The external surface of the bone shaft is less smooth and polished than in healthy animals. Other bones in the skeleton, as the scapula and pelvic bones, may in some instances give evidence of changes of a similar character.

Symptoms.—In the horse, by far the greater number of cases where I have encountered bone fragility and vascular changes of a general character have been closely linked together in the matter of causative influence. They were nearly all blood or well-bred mares of adult life, and far advanced in gestation. The bones affected were the pastern bones, larger and smaller, and the pedals. In none was this condition suspected previous to its sudden announcement by the detachment of prominent processes of these bones, to which the tendons and ligaments are attached. This fracture and detachment of bony prominences occurred apart from any appreciable inducing cause, as exertion, or sudden strain, or application of violence in any way. From these extensive structural changes, and, in some, complete destruction of locomotory powers, immediate destruction of the animals was necessary. In this way an opportunity was afforded for examination of the structures as they appeared and existed at the time of their greatest presumable fragility. This examination gave in every case the indications of moderate change in the animal constituents of the bone, a rarefaction and opening of the cancellous part, with encroachment upon the compact, commencing apparently from within and moving outwards. The animal constituents seemed, upon the whole, augmented in amount, filling the increased reticulated bone tissue; the increased vascularity and softness, together with the expansion of the cancellous structure, destroying the general power of cohesion and rendering the bones more liable to fracture. With sheep, amongst which I have observed a large amount of this bone disturbance, apart from the fatal results of the alteration—*i.e.*, their termination in fracture, and consequent slaughter—there can scarcely be said to be any preliminary indications by which the change may be detected during life. These fractures rarely occur in numbers at one time, but are irregularly distributed over a lengthened period. The causes which seem to operate in their immediate development are apparently the most trivial. The occurrence of rain sufficient to thoroughly wet

the ground, causing the sheep to dip or sink, is sufficient to operate in this manner. The rough handling of the flock with a dog, or an attempt to seize some for examination, may lead to the production of a fractured limb or two. Numerous cases, I have always observed, occur during moonlight, when the animals are easily disturbed, or, apart from disturbing influences, are disposed to gambol. In the fracture itself there are some slight differences from what occurs in a healthy bone when broken. It is attended with more effusion, and the immediately contiguous parts are at once more swollen, softer, and less well-defined. Any attempts to obtain reduction of the fracture and re-union of the parts are greatly more uncertain than in otherwise healthy animals.

3. *Osteo-porosis.*—This disorder of bone nutrition, or form of Rickets, appears rather selective as to the species of animals which it attacks, having been chiefly observed in horses. In these latter it is encountered in animals past infancy, rather during the age of puberty or maturity. Although seen amongst all varieties, and under different conditions of management, it has rarely been noticed to attack females. Its physical characters in the well-developed bone lesions are excessive expansion or rarefaction of bone tubes and bone spaces, without an increase in actual amount of earthy matter, but with a perceptible addition to the softer contents of the existing tubes and spaces. The rarefaction of the bone tissue and expansion of the Haversian system is coincident with increase of the medulla and softer contents of the canals and spaces. The greater number of the bones of the skeleton are liable to exhibit this condition of malnutrition; it, however, probably develops earlier and more perfectly in those of the head than in others.

Anatomical Characters.—By far the greater number, as well as the diagnostic, features of change are local. Generally-distributed textural alterations are only accidental, and, in great measure, arise from the local. With the exception of a somewhat pale and flabby state of the muscles of the voluntary class, a little congestion of the pulmonary tissue, much of which is hypostatic, a trifling increase of the fluid naturally existing in the serous cavities, and a softened state of the gland structures, the entire structural alterations are confined to the bones and the articulations with the different structures entering into their formation.

The periosteal covering of all the bones involved, but more particularly of such as are composed largely of cancellous tissue, is increased in vascularity and easily removed. The bone structure itself, particularly that of the bones of the head, and of the epiphyses of the long bones, is soft and easily compressed, yielding from their cut surfaces—for they may be divided with a knife—a bloody-coloured serous fluid, the open tubular structure being filled with a like coloured gelatinaform material. The main portions of the shafts of the long bones still retain a considerable portion of compact bone tissue of sufficient resistance to render them capable of resisting a knife. The articular extremities of the long bones are usually increased in size, and, although retaining around them the shell of compact tissue much as observed in health, are in their interior rarefied, and have the cancelli variously filled with either a dark, bloody-coloured fluid or a somewhat modified yellowish jelly, which, judging from the sensation imparted to the fingers, seems largely made up of fatty particles. The cartilages of encrustation are never in a perfectly healthy condition; in the majority this overlying structure is wanting in bulk, particularly at the edges, with occasional spots or erosions, when it seems wanting entirely; the colour, also, is altered from the natural pearly appearance to a dark slate or yellowish white; in this latter state the change is probably owing to the replacement of the intimate cartilaginous structure with fibrous tissue and molecules of fat. The synovial cavities of the joints contain, in the cases where the cartilage exhibits these changes, a moderate

amount of articular fluid, more viscid and darker than natural, from being mixed with the elements of extravasated blood; this latter may, in some instances, be seen as separate coagula. The synovial membrane and investing articular capsules are thickened, and present irregularly-distributed patches of congestion.

Probably, the most exhaustive and interesting, as it is the earliest, account of this peculiar bone disease of the horse, is that given by the late Professor Varnell in the records of certain investigations carried out by him in connection with an appearance of Osteo-porosis amongst a number of horses near Reading, and published in the *Veterinarian* for 1860. In that account, it may be observed that, in addition to conditions and appearances very much analogous to those which I have noted, that the after-treatment of the bones by maceration disclosed features and peculiarities not observed in the usual after-death examination; thus, it is there stated that "the ulceration of the articular surfaces, which seemed to be altogether confined to the cartilages of encrustation, was found, on their removal, to affect the bones beneath, and the loss of substance, however small it might be in the cartilage, extended more or less deeply into the bone, the size of the cavity increasing with its depth." This condition Professor Varnell considered, and not unfairly, as sufficient proof that the morbid process had its origin in the true bone substance, invading the cartilage at a subsequent period. It was found, further, that in cleaning the macerated bones great care was needed, lest by rough handling or undue force in detaching adhering fascia and ligament, projecting eminences were not at the same time broken off; this I can corroborate from personal experience. When thus cleansed by maceration, the external appearance of the bones is very characteristic. Instead of the close and smooth surface of healthy bone, these are rough, and, from the dilated condition of the minute foramina giving passage to the periosteal vessels, reticulated, resembling nothing so much as fine sponge.

Symptoms of Osteo-porosis.—The evidences of the existence of this peculiar condition are both local and constitutional, the former the more important as well as the truly diagnostic. The duration of symptoms ere a fatal termination is reached varies somewhat, but is rarely short, usually extending over a period of several months, and, when once these are established, the termination is invariably fatal. Probably, the earliest of these, which are attractive, is lameness of a peculiar character, passing from one limb to another without leaving the one first affected. In some animals, impairment of mastication or visible enlargement of certain bones of the head, without apparent inconvenience or pain, may appear previous to the existence of defective movement. Manipulation over these parts and certain of the joints, which, as in Rickets, are swollen, will elicit pain. When the maxillary bones, in which the teeth are implanted, are much involved, we may notice a peculiar rolling movement in mastication, the animal frequently ceasing to feed, not because the appetite is appeased, but because of weariness and pain consequent on the performance of the act. Even when locomotion may be performed with little distinctive lameness, we may detect marked rigidity of the trunk when turned rapidly or forced to move in a backward direction, together with an audible expression of pain. The same features may be exhibited by manipulation along the course of the spinal column.

(*To be continued.*)

PATHOLOGICAL SOCIETY OF LONDON.

AT the meeting of this Society, held on May 4th, Dr. HALE WHITE showed a series of specimens illustrating the Pathological Histology of Hydrophobia from two men and one dog. The medulla oblongata was in a state of acute inflammation, for the most part limited to the floor of the fourth ventricle and the subjacent nerve-tissue for a depth of about one-third of the thickness of the medulla. It was most marked in the median line on either side of the posterior median fissure. The result of this inflammation was a general blurring of the nerve tissue, so that the normal arrangement of fibres and cells could not be made out ; there were many small inflammatory cells in tissue, and under a high power of the microscope they could be seen in large numbers crowding through the walls of the vessels. The inflammatory exudation had a tendency to run in directions determined by the nerve fibres. The nerve cells were implicated, and in many places blurred and indistinct ; the nuclei most affected were the vagal and hypoglossal. The dilatation of the minute vessels was extreme, and had in many cases led to their rupture ; the hæmorrhages thus produced were all microscopic, and were most numerous immediately under the floor of the ventricle, so that blood could often be seen to be effused into the meshes of the pia mater, but in no place was this membrane itself ruptured. The same condition was observable in other parts of the brain, but to a much less degree, and it could be also seen in the cord to a slight extent. Thus, it will be gathered that the essential lesion in hydrophobia is an acute inflammation of the floor of the fourth ventricle, and that this spreads slightly upwards to the brain and downwards to the cord. In the salivary gland there was some blurring of the secretory epithelium, and a few leucocytes could be seen wandering about among the gland constituents. In one case there was an atrophic condition of the thyroid gland. The vagus and sympathetic nerves and every organ in the body were examined, but they were all found to be healthy with the exceptions just mentioned.

ROYAL AGRICULTURAL SOCIETY.

AT the monthly Council meeting, held on May 5th, H.R.H. the Prince of Wales, President, in the chair, Sir JOHN THOROLD stated that the Secretary had reported that, having been to France on the business of the Dairy Committee, he had seized the opportunity thus afforded him to visit Mons. Pasteur at his laboratory in the Rue d'Ulm. Having obtained an introduction from Mons. Tisserand (Director of Agriculture at the Ministry), the Secretary was at once admitted into Mons. Pasteur's private room, and, during a short interview, had received his cordial assent to the Society's desire to send a veterinary surgeon to his laboratory to study his methods of procedure with regard to the prevention and cure of certain diseases of animals of the farm by means of the attenuated virus of those specific diseases.

The Secretary had further reported that during his interview with Mons. Tisserand he was introduced to Mons. Chauveau, the author of the standard work on the "Anatomy and Physiology of the Domesticated Animals," which is well known in England through Dr. Fleming's translation. This gentleman had recently made a special study of the means of obtaining attenuated virus of diseases of animals, and of the effects produced by the use of various kinds. Having been recently appointed Inspector-General of Veterinary Schools in France, he was about to reside in Paris, and he expressed the pleasure it would give him to receive the Society's veterinary surgeons, and to give them all the aid in his power.

Professor Robertson had stated that he was prepared to go to Paris with a veterinary surgeon about the end of June.

PROCEEDINGS OF THE THIRD GENERAL MEETING

OF THE

NATIONAL VETERINARY ASSOCIATION.

(*Continued from page* 225.)

Mr. H. R. STANLEY: There is only one thing I should like to ask—viz., whether animals suffering from slight Pleuro-pneumonia are fit for human food? I think you may thoroughly make up your minds with reference to that. I have heard the argument in certain districts that if only a small portion of the lung is affected, it is fit for human food; *I am fully of opinion it is not.* I should not care to eat it myself, and I think we ought to set our faces firmly against others doing so. When the lungs are affected, the whole body must be so, and I do not think it should go for human food. It merely means that the ratepayers will have to pay a farthing extra in the pound, and it is not worth while to run the risk for that small sum.

Mr. GREAVES: In opposition to the opinion of Mr. Stanley, I think I may place Professor McCall's opinion before you, which is that it is only in the extreme cases of the disease that it is unfit for human food. I may tell you that in 1842 a great number of cows were destroyed and died of this disease in Manchester, and during the whole twelve months I was told that no other food was sent into the barracks; and the medical attendant told me that the soldiers had never better health than during that time.

Mr. MCGAVIN: I rise to confirm what Mr. Greaves says with regard to the consumption of animals affected with this disease. Some of us are inspectors, and it is a very responsible duty to the public and to ourselves; and the question arises what should we condemn for human food, and what should we pass? I have known some hundreds of animals killed in Scotland affected with Pleuro-pneumonia, and nearly all eaten, and I have never known any case of a person injured from consuming such food. A question I should like this meeting to settle is, in what stages should we pass the flesh of animals as fit for human food? I have seen animals affected with Anthrax—the early stages—killed and dressed for human food, and I have never known one case to interfere with the health of any person or persons who have eaten the flesh of such animals. I have also known animals under Swine Fever. I quite agree with what Mr. Rutherford mentioned about disinfection; he says that the lime merely covers over and hides the contagion of Pleuro-pneumonia. In my own experience, I have found that the best way of disinfecting any place where it is infected with the contagion is to use Calvert's Vaporiser, or heat a small heater and cover it with an iron cover, and pour carbolic acid into it. It disengages carbolic acid fumes, and the whole place is flooded with the fumes of carbolic acid, which destroys a great deal of the infection of contagious diseases. I have great pleasure in recommending that to the members here present.

Captain RUSSELL: We were talking just now about Pleuro-pneumonia subjects being fit for food. It has occurred to me, if the disease settles in the lungs, when taken through the mouth and nostrils and at the tip of the tail, how do we know that the flesh is affected at all? Has anybody ever seen the flesh affected? I have not. So soon as the lungs are affected, the muscular structure is affected. I read Professor Walley's paper, and did not see much that was new in it. I thought he had followed out the lines of "The Four Contagious Diseases," but since I have been here this morning I have learned that it is possible for a fever to exist in the body without elevating the temperature. That is new to me; I put it to you—If Pleuro-pneumonia is a contagious or infectious fever, how do you recognise it, and

account for cases, without elevation of temperature? I have not the least doubt you do have cases. There was another matter struck me: Mr. Rutherford said he never knew an outbreak to occur from a cow or bullock that had been inoculated, and then he drew the reservation—"if the animal at the time was not affected with the disease;" but if there was no elevation of the temperature in the primary stages, I take it the cattle were not suffering.

Mr. RUTHERFORD: I think I must make a few remarks before Professor Walley rises in reply to questions put. One gentleman asked, how about a case of Pleuro-pneumonia happening in an animal where inoculation had been performed seventeen days prior? Now, let me tell you that in performing inoculation over a large number of cows where infection has been, the probabilities are—and my experience points to this conclusively—that if an animal at the time of inoculation has the disease in an incubative stage, that incubation is matured much more rapidly, and you have the true disease developed long before the seventeenth day. In a paper I read some time ago, I stated that the inoculator could assure his client after the fourteenth day that all danger of the disease spreading was over. With regard to the consumption of the beef, I am not an inspector, and the question was never brought before me. My opinion is that so long as there is not complete destruction of the lung, the tissues themselves are not affected to such an extent as to injure them for consumption. When the lungs are no longer capable of performing their function the flesh should be condemned. It has happened in my experience, not once but several times, that there has been no rise of temperature. The first case was one where I had examined the temperatures of twenty or thirty animals, and I observed there was no rise in the thermometer, although the symptoms of the disease were present. In saying that the temperature does not always rise in ratio with the progress of the disease, I simply state a fact.

Professor WALLEY: I will just run through the points seriatim. Mr. Rutherford said the introduction of the virus into the tissue, resulting in the production of the lesions, showed that the disease is infectious. It does not necessarily do anything of the kind: it shows that the material is infective, but not necessarily contagious or infectious, or that it can be propagated from one animal to another through the atmosphere, in the way that infectious diseases generally are. There is one outbreak he referred to, in which a number of byres were visited by the disease, and which spread through the byres and over the canal to others. That certainly was a remarkable incident. What about all these cases? Are we to assume that every one of the owners of these byres went into the market at the same time, and that every one of them bought in a beast in the incubative stage of Pleuro-pneumonia? If so, it is a remarkable thing that at that particular period it was the only district in which Pleuro-pneumonia existed. Out of 110 to 120 byres there was no place in which Pleuro-pneumonia existed except that; and surely if this set of men purchased animals in the incubative stage of the disease, other men could have done, and naturally would have done, the same thing. So that I quite agree with Mr. Rutherford that Pleuro-pneumonia is propagated by other means than actual contact. I have made a remark that if Pleuro-pneumonia is only propagated by actual cohabitation, how is it that we have not stamped it out—how is it that the Government has not stamped it out? I do not think any man in the room will assert that it is the only means. Mr. Rutherford said he had no proof that animals inoculated ever gave the disease to other animals; he modified it by saying, if they were the subjects of the disease at the time they might so propagate it. I point this out as one of the disadvantages of inoculation: that is, an animal may have Pleuro-pneumonia in its system—in its lungs—at the time it is inoculated; the inoculative lesions become well developed; the

Pleuro-pneumonia goes on simultaneously, and the animal dies. And, on the other hand, there is a probability that the Pleuro-pneumonia lesions may become materially circumscribed, and the animal may become a centre of infection (and that frequently goes on for months and years) to every animal it comes in contact with. That corroborates the remark I made, that animals that have once had the disease become separate sources of infection. Mr. Robinson made a remark in reference to Professor Laws; Professor Laws did not state that he had propagated Pleuro-pneumonia to a healthy animal by the introduction of a piece of sponge saturated with Pleuro-pneumonia lymph into its nostrils. He made a statement to the effect that Mr. Baldwin many years ago propagated it in that way. With reference to experiments, I do not wish to detract from the value of experiments in any shape or form; I say that experiments, have over and over again proved to be very misleading; and I need not quote one instance further than the experiments in Foot-and-Mouth disease to which I have alluded, when it was stated that, in consequence of those experiments, it could not be propagated from animal to animal. That was proved to be wrong. So that I look upon experiments, till verified, with a certain amount of doubt, if not suspicion. When speaking of the symptoms of the disease, Mr. Rutherford said—and several gentlemen subsequently made remarks about there being no rise of temperature in Pleuro-pneumonia—"it has been well stated by Captain Russell that if a fever exists there must necessarily be a rise of temperature." Well, now, I think a little mistake has crept in here in Captain Russell's mind. I do not believe there is a case of Pleuro-pneumonia in which a rise of temperature cannot be discovered during the disease; and if you refer to page you will see that I say: "Variations of temperature are sometimes very marked; it frequently lowers when effusion takes place, and I have often found it lowered from 1½ to 5 degrees within twelve hours." That has occurred in my experience frequently. The explanation is that—when effusion takes place, the active stage of the fever has passed away and naturally the temperature lowers. I do not see anything remarkable in it, further than that it is a matter that should not be misunderstood. Mr. Simpson asks a question with reference to animals dying from inoculative lesions, and also as to the use of the flesh. In the City of Edinburgh no compensation is given for an animal dying of inoculative lesions, unless we can show at the same time some evidence of lung affection. The Privy Council takes no steps in the matter at all: they simply say, "We do not interfere with inoculation in any shape or form; you do just as you like." It neither prevents inoculation nor allows compensation if an animal dies from it. With reference to the use of the flesh, if you refer to my paper you will find full reference as to the use of the flesh. I have said that I cannot see there can be any objection whatever to its use so long as there is no evidence of any change in the tissues; if the flesh is firm, of a natural colour, with no effusion, moisture, or anything of the kind, I do not see that you are warranted in condemning it. Years ago, in whatever stage the disease may have been, the flesh was always sold. And now for many years, when I have had to deal with it, every good carcase has been sold by my consent; I never refuse to give it so long as the flesh of the animal exhibits no marked change. Mr. Rutherford made the statement that he was not an inspector of flesh. In the City of Edinburgh, it is the public inspector of the markets who is empowered to say whether the flesh shall or shall not be condemned; if any doubt arises I am myself consulted with reference to it, as is also the medical officer of health; but I do not think it is our duty to interfere in these things unless we are specially called upon to do so. Now, going on to what I consider the most important part of the discussion, in reference to inoculation, Mr. Rutherford stated the

operation was not condemned in Scotland. You must remember the remarks I have made on that point were published in 1879, and I am in a position to say that there was at that time a great deal of opposition to it amongst the dairymen. And even during the last month an outbreak occurred, and I said to the man, "Why don't you get the cows inoculated?" and he said, "I have a great objection to it," and he lost three or four before he would consent to have the operation performed. With reference to the general success of the operation, Mr. Rutherford spoke as if I had condemned or materially objected to the operation. You will find I did nothing of the kind; on the whole, I am distinctly in favour of the operation, within certain bounds. My objection is that, I believe it can never be the means of effectually arresting the spread of Pleuro-pneumonia in this or any other country; and the fact I have pointed out, that an animal may have the disease in its lungs, although it has apparently recovered and become a centre of infection, is, I think, a strong argument against it. If inoculation is to be of any practical service, every animal in the country ought to be inoculated; and I have pointed out, what Mr. Rutherford himself has stated, that it should be an imperial and not a local question. Mr. Rutherford says you are likely to get best results if you use fresh lymph. I decidedly disagree with him in *condemning* preserved lymph. I have inoculated with lymph twelve months and two years old, preserved in glycerine, and that successfully. At the same time I candidly say, if you can get fresh lymph, use it. With reference to its preservation in tubes, it is done in the case of the human subject with regard to vaccine, and why on earth should we not do it in this case? Mr. Rutherford says there are no means of preventing Pleuro-pneumonia spreading other than by inoculation. It has happened over and over again that if an animal is taken out immediately the disease is noticed and slaughtered, the disease goes no further. I have made a remark about that on page . With reference to disinfection, I quite allow that whitewash is useless if it is put on cold. If you have lime-wash, and use it hot, I defy any germs in creation to withstand it. Lastly, in reference to Continental inoculation, I refer to page of the paper; I have given you the actual figures, and I ask you to look them over at your leisure and see what inoculation has done in comparison with what slaughter has done in the Netherlands. I am not one of those who say it is derogatory to our profession to advise slaughter. I prefer the rifle to the pole-axe. But I do say it is the duty of our profession to recommend the adoption of those measures which are best calculated to arrest the spread of a destructive disease like Pleuro-pneumonia—a disease which has killed hundreds of thousands of animals, and which will continue to do so unless some more effective measures are adopted or ordered by the Privy Council to arrest its spread.

MAJOR SUBJECT II.

SWINE FEVER—SWINE PLAGUE.*

BY PROFESSOR T. WALLEY, M.R.C.V.S., PRINCIPAL OF THE ROYAL (DICK) VETERINARY COLLEGE.

Synonyms.—Hog Cholera, Typhoid Fever and Enteric Fever of Pig, Blue Disease, Red Soldier, Measles, Pig Distemper, Contagious Pneumo-Enteritis (Klein).

* Seeing that the discussion on Pleuro-pneumonia was likely to be considerably curtailed, on account of the unfortunate incident connected with the production of the paper on that subject, the Provisional Committee accepted the offer voluntarily made by Professor Walley, to prepare a Supplementary Paper on Swine Fever, and they trust that the interest attached to this important subject at the present time will be held by the members of the Association as justifying them in cordially accepting Professor Walley's offer.

As in the case of other diseases, so in this, many synonyms have been employed to designate it, some of them referring to some characteristic external symptom, as the colour of the skin or the character of the skin eruptions; and others to some fancied resemblance in its internal lesions to those of well-known forms of disease. Unquestionably the present official synonym, "Swine Fever," or, better, "Swine Plague," is the most simple and the most useful for all practical purposes.

Definition.—A specific eruptive fever, peculiar to the pig.

Nature and Characteristics.—Many years ago, when I first became familiar with this malady, I looked upon it as a sporadic or enzootic affection, due to an altered condition of the blood, as the result of purely local causes, *e.g.*, bad hygiene and improper or impure dieting; I was of opinion, in other words, that, like Purpura hæmorrhagica, it was simply a blood lesion, and in my earliest lectures on the subject described it as such, and drew parallels between its lesions and those of Purpura. Nor did I stand alone in this estimate of its character. In America it was also mainly attributed to bad hygiene and bad dieting; but, earlier in the United States than here, it was gradually recognised as a zymotic disease and of a contagious character.

In the United States of America it was thought to be of the nature of Cholera, and this is not to be wondered at when we consider its fatality, its rapid spread, the enteric conditions with which it is associated, and the state of collapse into which its victims are sometimes thrown.

Subsequently an idea prevailed that the disease was allied to the Typhoid Fever of man, and that, too, mainly from the fact that necrotic enteric changes were common; but as early as 1876 or 1877, Klein showed that a great mistake had been made, pointing out that *the lesions of human Typhoid were confined mainly to the small intestines, and were localised in the lymph follicles thereof: and further, that the necrosed tissues on desiccation leave behind pit-like depressions and not unfrequently result in perforation;* whereas in Swine Plague *the ulcerative lesions are confined mainly to the large intestines (often grouped around the ileo-cæcal valve), seldom extend to the small intestines, and are still less often found in the stomach.* (I have only seen two well-marked cases of ulceration of the stomach, one specimen of which, sent to me by Mr. Kettle, I exhibit.) *The lesions are not localised in the lymph follicles, do not as a rule extend deeper than the superficial mucosa, and rarely produce perforation.* About 1878 Klein suggested that the disease ought to be designated *Contagious Pneumo-Enteritis*, and he did this on the assumption that Pneumonia was a constant lesion; in this, however, he was certainly mistaken, as I have seen numbers of instances in which lung lesions were conspicuous by their absence.

In 1877 Klein drew attention to the presence constantly, in the local lesions of the disorder, of colonies of micrococci, and to these he was evidently inclined to attribute specific properties.

At a much earlier period than this I had drawn the attention of the members of my class to the presence of micrococci in the blood and tissues of pigs which became the victims of the disease in the neighbourhood of Edinburgh.

In 1878 Klein drew attention to the fact that there existed in the peritoneal effusions and elsewhere a *bacterium* which, in its morphological characters, bears a close resemblance to the bacillus of hay infusion (*B. subtilis*), and in some respects to the *Bacillus anthracis*; the important differences being that the bacillus of Swine Fever is finer than either of the others, and although multiplying by spores, it is motile and somewhat rounder at its end. Recently Pasteur has described a dumb-bell-shaped microbium. Klein looks upon these as foreign to Swine Fever.

Not only by Klein, but by Professor Laws and others, has the virus of

Swine Fever been cultivated and attenuated, and with the modified virus animals have been inoculated, and, according to Laws, protected ; but Klein's experiments in this direction show that even after several inoculations the virus is still capable of producing specific symptoms, though the mortality is materially reduced. Not only has the pig been successfully experimented upon ; rabbits and mice are shown to be susceptible to the action of the virus, while Pasteur has also stated (though this is contradicted by Klein) that pigeons are also affected by it.

Swine Fever is no respecter of persons amongst the pig tribe. It attacks the young, the old, the fat, the lean, the well and the ill bred, the male and the female alike ; but in my experience pigs varying from six or eight weeks to several months old ("shots," as they are called in Scotland) are most susceptible, and in them the mortality is greatest, while large pigs, as sows, frequently escape it, or if attacked, recover. Young pigs *in utero* often die and are aborted, or if they survive through the normal period of parturition, are puny and short-lived ; while sucklings not unfrequently pine away one by one, until the whole litter is exterminated, even before the mother gives any evidence of being herself affected with the disease. Frequently, too, the mother will pass through the nursing stage *apparently* in good health, but after the offspring have been weaned or have died out, she will gradually emaciate, and ultimately succumb to enteric, hæmal, or pulmonary disease. There are those who attribute the death of the fœtus *in utero* to the fact of its being supplied with impure blood, or to histological changes in the placenta, and not to the direct action of the virus of the disease. Such a statement has been made in reference to Anthrax, and even some of our best authorities declare *that anthrax lesions are never found in the fœtus* (*or its blood*) in utero, *the placenta acting as a filter, and effectually preventing the passage of the bacilli.* To this statement I give a flat denial. *I have found extravasations and effusions into the tissues of the unborn lamb, and I have found bacilli in these products and in the blood when I have failed to find them in the blood or tissues of the mother.* In Swine Fever, as in other zymotic affections, abortion is often the salvation of the pregnant female.

Swine Fever may assume either an enzootic or an epizootic character. Probably never within the memory of the present generation of veterinary surgeons, in this or any other country, has it spread so rapidly or so widely as in the prevailing epizootic. What the determining cause of this wide-spread outbreak may be, it would be difficult to say ; but I am satisfied of one thing (and do not hesitate to make the assertion here), and that is, that the disease has in the past been practically left to wander as it listed ; that it has existed in certain districts (and that not always owing to the fault of the authorities) for weeks or months before it has been detected or recognised ; while during the whole of that time animals from the infected areas have been sent into surrounding districts, and have thus scattered the disease far and wide. Moreover, a remarkable amount of ignorance as to its diagnosis has been exhibited, even by veterinary surgeons, and it was on this account mainly that I suggested to the Provisional Committee of the National Veterinary Association that the subject of Swine Fever would be an appropriate one for discussion at the Birmingham meeting.

Swine Fever, perhaps more than any other similar malady, presents itself under a variety of aspects ; in other words, its visible manifestations and the localisation of its lesions in different outbreaks assume very different characters. In its clinical character it is *hydra-headed*, and this fact alone is sufficient to explain the apparent anomaly that scientific men have not always been able to recognise it when the malady has been for the first time brought under their immediate notice. Not only so, but even in one and the same outbreak it often passes through different phases ere it runs its course ; thus,

the first few animals attacked may show no external manifestations of the disease; they may pine and waste gradually away, perhaps coughing or purging to some extent, but showing no symptom sufficiently pronounced to raise even a suspicion in the mind of the owner or the attendant as to the nature of the malady which is gradually but surely emptying the pig-styes of their occupants. At another time a number of animals are attacked with symptoms of narcotic poisoning—staggering about their styes, boring their heads against the wall, passing into a state of convulsions, foaming at the mouth, and champing the jaws or gnashing the teeth, as the pig is wont to do when under the influence of a cerebro-spinal excitant. Again, the animals appear to be suffering from rheumatic cramp, and when called upon to move not unfrequently do so with their fore legs spasmodically flexed, the motive power being supplied entirely by the hind legs. But after a time, in each of these cases, characteristic enteric, cutaneous, or pulmonary lesions are developed, and the matter is set at rest. In other outbreaks the lungs are most largely the seat of organic changes, while the existence of bowel lesions is the exception that only proves the rule; and lastly, there are cases in which the skin and enteric lesions are so pathognomonic as to leave no doubt in the mind of the veterinary surgeon as to the nature of the malady with which he has to deal, and there are others in which no sign (external or internal) exists to show what the disease actually is.

Swine Fever is in every sense both infectious and contagious.—It is disseminated (to limited distances) through the medium of the air; by means of such fomites as water, food, litter, urine, fæces, dung; by other animals, *and above all by ducks, poultry, and rats;* by contaminated conveyances, such as railway trucks, floats, carts, and vessels; by the dirty boots and clothes of attendants; by the actual cohabitation of healthy with diseased animals, and by direct inoculation. I was at one time inclined to think that in those outbreaks in which lung lesions were most pronounced the disease had been contracted by inhalation, while in those where bowel lesions were most prominent it had been contracted by ingestion, just as I believe is often the case in Anthrax; but on considering the matter more closely in the light of our present knowledge of the fact that, as a rule, in most of these maladies the virus must gain access to the blood before it can produce its characteristic effects, I have been led to modify my opinion in this respect certainly. The manner in which the lesions of some of the granulomata—*e.g.*, Tuberculosis, Actino-mycosis, and Gregarinosis (?)—are locally developed, according to the manner by which the fungus is introduced into the system, seem to support the view mentioned, but we must of course remember that the starting-point of at least two of the maladies referred to is at some exposed part, as the nostril or the mouth.

In a recent number of the *Journal of Veterinary Science in India*, the details of a very instructive experiment carried out by Mr. Fred. Smith, with a view of determining the method by which the virus of Anthrax is introduced into the system, are given; and in this case the striking fact is demonstrated that while the anthrax virus was carefully administered to a horse in the form of a ball, *the resulting lesions were manifested mainly in the lungs, and but very slightly in the bowels.*

Swine Fever *does not necessarily attack all animals exposed to the influence of the virus*—a very large percentage escape—*nor is it in every outbreak equally fatal.* In years gone by I used to treat this malady with great success, and certainly saved fifty per cent. of the animals treated; and even now I feel quite satisfied that numbers of pigs pass through the disease without manifesting any recognisable external symptoms, no matter how carefully they may be watched, and recover.

Does one attack of the disease protect against future attacks?—According

to the evidence afforded by Dr. Klein's experiment on the protective value of Swine Fever virus, the question should be answered in the negative ; but in the past few months I have had the opportunity of watching several animals that during a previous epizootic were attacked by the malady and recovered, and which during the present outbreak have successfully resisted its influence.

Swine Fever, so far as I know, has never been transmitted to any other of our domestic animals, nor except experimentally to any other creature ; and while mice may be successfully inoculated with the cultivated or natural virus, the rats seem to enjoy perfect immunity from its effects—at least so I conclude from the fact that these animals cohabit with pigs (in all stages of the disease), and live with them on the most intimate terms, without showing any signs that they are in the least degree affected by the virus of the disease. *Swine Fever is as pre-eminently a pig disease as is Cattle Plague a bovine disease.*

The extent of vitality possessed by the virus of Swine Fever has as yet to be determined ; but of one thing I am quite assured from experience and observation, and that is, *that it may retain its vitality for several weeks, if not for months, in dirt or other suitable pabula.*

Its incubative stage has been shown experimentally to be confined to about four or five days, but naturally it is about ten or twelve days.

Its duration is somewhat indefinite. As in the case of Pleuro-pneumonia so here ; an animal may be labouring under the influence of the virus for many days without attracting the attention of those persons who have charge of it. On the contrary, it may be well, and dead in the course of several hours, or two or three days ; while in not a few instances it runs a sub-acute or chronic course, which may extend over several weeks, or a month or two.

SYMPTOMS AND COURSE.

The invasion of Swine Fever is sometimes very pronounced ; at others its actual existence is evidenced by indeterminate symptoms, its special characteristics being slowly and insidiously developed.

Constitutional Symptoms.

In the earlier stages there is always more or less fever, the temperature being elevated two or three degrees, the pulse increased in rapidity, the bowels constipated or relaxed, occasionally there is vomition, and sometimes a husky bronchitic cough. The animals show a marked tendency to isolate themselves, and in cold weather seek warmth by burying under litter or huddling close to their companions ; they frequently refuse to rise when recumbent, and at all times rise unwillingly and stiffly, and when made to move do so with a stiff gait, and soon show signs of exhaustion if submitted to exertion. The ears are frequently lopped, and not unfrequently present a congested appearance. The conjunctiva is injected, and there is sometimes lachrymation or discharge of a small quantity of agglutinous mucus from the inner canthus of the eyelids.

In the most advanced stages the above symptoms become aggravated and more pronounced, but their characters will depend largely on the seat of the lesions. The temperature rises to 105-6-7° F., the pulse becomes more rapid, the breathing hurried and occasionally jerky, the urine scanty and highly coloured at times, normal in character at others, *but frequently evolving a peculiar characteristic odour.* Wasting of the muscles proceeds apace, weakness increases, the movements become more unsteady, and often the hind legs are plaited one over the other. Food is refused, or only

taken in small quantities, *but there is frequently great thirst.* The irregularity of the bowels is more marked, and the fæces become of a dark colour, *pasty, and of a very unpleasant but characteristic odour.* In the case of pregnant sows, abortion sometimes takes place as the disease advances, many of the young pigs being dead, some decomposed. Occasionally a little blood is discharged from the conjunctivæ or the nostrils.

If the bowels are inflamed or ulcerated diarrhœa replaces constipation, the discharges being of a dirty chocolate colour or of a yellow-ochry hue, and in any case they have an abominable odour, and are sometimes passed with a jerk, and, as the end approaches, involuntarily. At other times the egesta is retained, accumulates in the large intestines, undergoes decomposition, liberates sulphuretted hydrogen, producing tympany, which gives the animal a rotund appearance, and thus deceives the careless observer—it being taken for granted by such that the patient is eating well, and consequently that there cannot be much the matter.

If the lungs are markedly affected the breathing becomes laboured as well as hurried, the cough (especially if animal excited) distressing; there may be catarrhal discharge from the nose and eyes, that from the latter causing dirt to adhere to the eyelids, thus giving the animal a very peculiar appearance. There is often a short, painful, hollow grunt, and on physical examination of the chest signs of consolidation are readily detected. *The skin of the ears and abdomen is often cyanotic,* and the extremities cold, and not infrequently foam (sometimes bloody) oozes from the nostrils, and when this takes place the breathing becomes gasping and oral.

If the brain or the cerebral meninges is involved the animal presents a stupid appearance, wanders aimlessly and mopishly about, staggers like a drunken man, and often falls helplessly over, or if excited is thrown into a state of convulsions, on the passing off of which it is left lying helplessly on its side. At other times the head is bored against a wall or thrust into a corner, or the nose is buried in the litter, producing nasal stertor; the pupils of the eyes may be contracted or dilated, and the retina may be markedly injected.

If the spinal cord or its meninges is affected there is marked muscular twitchings, clonic spasm, and partial, followed by total, paralysis.

The Local External Lesions

Are to be found in the skin. They consist of (*a.*) Discolorations; (*b.*) Vesication; (*c.*) Pustulation; (*d.*) Papulation; (*e.*) Sloughs; (*f.*) Desquamation.

(*a.*) THE DISCOLORATIONS *vary from a pale blue or light red to a dark livid blue, purple, or black.* At times a scarcely perceptible erythematous black is to be discerned on the skin of the abdomen, the vulva, the hocks, the ears, the throat, or the inside of the thighs; or it may be a little cyanosis (blueness) of the ears. In some cases this discoloration is diffuse, at others in discrete patches; when faint and undecided the animal should be excited a little, and the entrance of air to the lungs excluded for a short time; the discoloration of the ears is rendered more distinct by taking the pig up by the hind legs. In many instances the undecided erythema during life becomes very pronounced, and, chameleon-like, passes rapidly through various hues after the animal is stunned by a blow on the head.

In the course of a few days—hours in some cases—the discolorations become more pronounced and more permanent; at first, being due only to capillary congestion, they may pass off, but as venous congestion sets in, followed as it usually is by extravasation, the colour becomes deepened, and the cutaneous structures positively stained, and if the pig recovers, it subsequently passes through the changes seen in ecchymoses from other causes, desquamation of the cuticle taking place as it passes off; on the contrary,

the interference with the circulation is so great as to lead to necrosis, *usually arterial and consequently dry*, and sloughing.

In very many cases no pathognomonic discoloration exists; but even here it will be observed that the dermis over the lateral and inferior aspects of the body contracts a peculiar yellowish brown hue.

Cyanosis is often the result of imperfect oxidation from the existence of extensive lung lesions.

(*b.*) VESICATION *is rarely a primary lesion, and still more rarely is it a solitary lesion,* being usually seen during the course of the disease, the vesicles forming in the patches of healthy skin, and being usually followed by desiccation and desquamation. The bullæ associated with sphacelus may be mistaken for vesicles.

(*c.*) PUSTULATION, *like vesication, is rarely primary or solitary,* nor is it seen except in the most virulent cases. In some instances there is a distinct collection of pus under the epidermis, in other instances the apparent pustulation partakes more of the character of a circumscribed pemphigus, being marked by circular patches of a very dark red colour, followed by the effusion of sanguineous serum and a little pus, the fluids drying and the superficial parts of the skin becoming necrosed, giving to the patches an appearance similar to that produced by the action of a powerful escharotic, such as nitrate of silver, or in some instances like the lesions seen in a virulent septicæmia.

(*To be continued.*)

Parliamentary Intelligence.

House of Commons, April 20th.

VETERINARY SURGEONS IN INDIA.

In reply to Mr. J. M'CARTHY,

Mr. S. HOWARD said: As was stated to the House on March 12th last, in reply to a question from the hon. and gallant member for Holborn, a reduction in the veterinary establishment in India has been sanctioned by the Secretary of State in Council, on the recommendation of the Government of India. There is, however, so far as I am aware, no desire to alter the existing proportions of senior and junior officers in the department. There is at present no civil veterinary department in India, but the creation of a civil branch of the service is at present under consideration. No representation has been made by the Government of India that the number of skilled surgeons in the country is insufficient.

May 14th.

IRISH PORTAL INSPECTORS.

Mr. COX asked the Chief Secretary for Ireland whether he had received a memorial from the veterinary portal inspectors under the Privy Council of Ireland praying for an inquiry into and redress of certain grievances; whether the Government would place them on a footing analogous to that of the veterinary surgeons employed by the English Privy Council, and whether the Government would consider a scheme for their superannuation.

Mr. MORLEY: The memorial in question has been before me, but in present circumstances I do not think the Government would be justified in considering the question of changes in the position of these officers who, I may observe, stand at present—in most, if not all, essential particulars—very much on the same footing as similar officers in England.

Obituary.

WE have to record the death of A. J. Shorten, M.R.C.V.S., of Ipswich, who died suddenly of Apoplexy on May 1st. Mr. Shorten graduated in 1849, and was one of the best-known and most successful practitioners in the Eastern Counties. The following notice of the melancholy event is from a local paper:—"On Saturday morning, Mr. A. J. Shorten, the well-known veterinary surgeon, died very suddenly at his establishment in Museum Street, Ipswich. He got up about his usual hour in the morning, and went after breakfast into the stables. Meeting the head ostler, Henry Green, about ten minutes to ten, he went with him to a loose-box at the top of the yard, opposite the dispensary door, and told him to take the bandages off the leg of a black mare to see how she was getting on. Green was obeying his instructions, and Mr. Shorten, who a few minutes previously had been in the surgery and had lit a cigarette, was leaning over the half door of the box watching him, when suddenly he started up, put his hand to his heart with a sharp cry, and rushed away to the surgery. He had just got inside the door when he fell with his face downwards, and his head resting against a drawer. Mr. Taylor, the surgeon attached to the stables, who came in almost at the same moment, thought Mr. Shorten was looking for something, but seeing he did not move, he raised him and found him unconscious. Mr. Taylor at once sent up for Mr. G. S. Elliston, who came down immediately, but all aid was unavailing, and Mr. Shorten died in about five minutes. He had been suffering very much from inter-costal Neuralgia, and for the last six weeks had been under the care of Dr. Henry Morris (of London), and of Mr. G. S. Elliston. On Saturday morning, however, Mr. Shorten appeared to be better and more cheerful than he had been for some time past, and he said himself that he had had a better night's rest. Mr. Elliston informs us that the immediate cause of death was not connected with his illness, but was a fit of Apoplexy. Mr. Shorten, whose loss will be felt and deeply deplored, not only in Ipswich, but throughout the Eastern Counties, was a man consistently kind and good-natured to every one, never refusing to help any man or any animal out of trouble. As one of the men in the stables put it—'He was one of the best fellows that ever lived, sir. I never knew any one with a kinder heart to man or beast.' And the speaker turned round quickly with a sort of choke, and began rubbing down the horse he was engaged upon with a sudden access of briskness that must have considerably astonished that animal. Not only was Mr. Shorten one of the kindest, but one of the best and most valued veterinaries in the county. Born in 1828, so that, at the time of his death he was in his 58th year, he obtained his diploma in 1849. He was a member of the Royal College of Veterinary Surgeons, Honorary Fellow of the Veterinary Medical Association, Chief Inspector for the County of Suffolk and the Borough of Ipswich under the Contagious Diseases (Animals) Act, Provincial Consulting Veterinary Surgeon to the Royal Agricultural Society of England, and he also undertook the duties of Clerk to the Ipswich Race Committee for the present year."

We are also informed of the death of Samuel A. Baker, M.R.C.V.S., of Chelmsford, who graduated in 1853.; and Edward Slipper, M.R.C.V.S., of Norwich, who entered the profession so recently as 1880, and entering into partnership with Mr. Santy, of that city, gave great promise of being a credit to the profession.

The Registrar of the R.C.V.S. sends the following additions :—J. Brown, of Navenby, graduated 1841 ; J. Johnson, B. Auckland, graduated 1872 ; J. W. Winter, Natal, graduated 1836 ; G. Whitworth, Grantham, graduated 1876 ; J. Hunley, late A.V.D., graduated 1861.

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Army Veterinary Department.

AT the Levée held by command of the Queen, by the Prince of Wales at St. James's Palace, on May 3rd, Veterinary Surgeon Matthews, Royal Horse Guards, was presented by Field-Marshal Sir Patrick Grant, G.C.B.

Notes and News.

LITERARY ANNOUNCEMENT.—We understand that Mr. Charles Gresswell, of Nottingham, in co-operation with Mr. George Gresswell, recently Lecturer in Physical Science under the Government of the Cape of Good Hope, have almost completed their "Veterinary Pharmacopœia and Therapeutic Guide." This work will be in accordance with the most recent discoveries of veterinary science, and will form a complete handbook for practitioners and students of veterinary medicine. We also have to announce the forthcoming production from the pens of Dr. A. Gresswell and Mr. James Brodie Gresswell, entitled, "Diseases and Disorders of the Horse," a general treatise written with the special object of serving as a guide to the intricacies of veterinary medicine and surgery, and thereby proving clearly to the public the immense advantages in the way of saving life, and ensuring and improving health, to be derived from a wide extension of the employment of the enlightened and scientific veterinary surgeon. The book will be ready at an early date, being now in the printer's hands.

RABIES AMONG FOXHOUNDS.—Owing to a serious outbreak of Rabies amongst the pack of foxhounds with which Mr. Bragg hunts the Moreton-Hampstead country, in Devon, it was recently determined to destroy the whole pack. The disease was brought into the kennels by a draft of young hounds recently purchased. This is the second pack of Mr. Bragg's that has been destroyed from a similar cause. A meeting of the hunt was called immediately with a view to replacing the pack.

A STRANGE DISEASE.—A peculiar nervous disease, with Stringhalt for a symptom, has appeared in Victoria, Australia. The Melbourne *Leader* states:—"About Beaufort several cases have resulted fatally. It is generally supposed to be caused by eating too much of that noxious weed known as flatweed in some parts, and dandelion in others, though it is not the true dandelion, but *hypochæris radicata*. Whether the disease is really attributable to that plant we are not aware, but it is rapidly spreading over the face of the country, and being particularly luxuriant this year, it is possible that the affected horses may have eaten it to excess, and thus deranged the functions of the kidneys and other viscera."

DEATH OF A MAN FROM SWINE FEVER.—A case of death from Swine Fever is reported to have just occurred at Dunley Manor Farm, near Andover, a man named Rumbold having contracted the disease through the blood of a pig affected with Swine Fever having come in contact with a wound on his hand causing death after a few days' illness; the surgeon who had been in attendance on the unfortunate man had no hesitation in certifying that death resulted from this cause.

DECOMPOSITION AND FERMENTATION OF MILK.—A German *savant*, Dr. F. Hueppe, who has paid great attention to this subject, has just described five distinct organisms which he finds to be invariable accompaniments of lactic fermentation. One of these he isolated on nutrient gelatine in the form of white, shining, flat, minute beads. This organism has the power of transforming milk sugar and other saccharoses into lactic acid, with evolution of carbonic acid gas. It is usually found in the saliva or mucilage of the teeth. In these are two micrococci, both of which cause the production of lactic acid, but which manifest differences in their development under cultivation.

There are also two pigment-forming bacteria. These five bacteria are so different and so constant in their properties that they must, in Dr. Hueppe's opinion, be regarded as distinct species. In addition to them there is also in milk an organism which transforms milk sugar into gluconic acid.

CATTLE PLAGUE.—Reports from St. Petersburg state that the Cattle Plague still exists in the provinces of Bessarabia, Volhynia, Ekaterinoslav, and Taurina. Cases of Cattle Plague are also reported from the Dutch colony, Java.

LOSSES FROM SWINE PLAGUE.—The losses from Hog Cholera last year in the United States are, according to statistics gathered by the Agricultural Department, stated to have been more than £5,000,000, and for several years past they have run from £2,000,000 to £5,000,000 annually. The Agricultural Department are carrying out painstaking experiments with a view to the prevention of the disease. The germs of the disease are shown in all stages of development. A carefully-arranged incubator is filled with delicate glass vials that contain prepared meat tea, and in this preparation germs are placed for development. These germs at various stages of development are mounted for study under a powerful microscope. In this way their various characteristics can be easily determined. Experiments in inoculation have been largely conducted upon mice, which are subject to the disease and have practically the same symptoms as swine.

HONOURS.—At the meeting of the Academy of Sciences of Paris, held on April 19th, M. Chauveau, Inspector of the French Veterinary Schools, was almost unanimously (47 votes of 50 voting) elected a member—Rural Economy Section—in the vacancy caused by the death of M. Bouley. It had been decided at a previous meeting that, in principle, only veterinary candidates should be presented to the Academy to fill this vacancy. The National Agricultural Society of France has elected M. Goubaux, Director of, and Professor at, the Alfort Veterinary School, to be a Member, *vice* M. Bouley, deceased. We heartily congratulate our distinguished colleagues for this additional and high distinction conferred upon them. Dr. Fleming has been elected an Honorary Member of the New Jersey State Veterinary Society.

TAPE-WORM IN DOGS.—Dr. J. D. Thomas has been conducting a series of investigations in the Australian Colonies, with a view to demonstate the presence of Tape-worm (*Tænia echinococcus*) in the dogs domesticated there. In 1882 there were 30 dogs examined, and 40 per cent. of them were found to be infested with the parasite. In connection with this statement Dr. Thomas remarks as follows :—"It should be stated that nine dogs have been examined by me more recently, and that in only one of these could I find *Tænia echinococcus*. This series of dogs differed from the former one in some respects. The first group of dogs consisted of vagrant and ownerless animals that must have picked up their living largely from slaughter-houses, butchers' shops, and offal heaps. These naturally would have many opportunities of eating the viscera of slaughtered animals, cast aside as unfit for sale. When the second series was procured, a very energetic raid against unregistered dogs had been made by the police for several months, consequently many of the dogs of this group had owners, by whom they were fed, but who were unwilling to pay the registration fee required by law. In Melbourne, ten stray dogs collected in the town of Hotham (which is really a part of Melbourne) were examined on January 15th and 16th, 1883. Five of them contained *Tænia echinococcus* in greater or less number. These observations show a very alarming prevalence of this dangerous parasite in the places where inquiry into the matter have been made, and fully explain the frequency of the cystic form (hydatid) both in man and the domestic herbivora of these localities." The facts cited above afford one more argument in favour of the systematic destruction of vagrant dogs on the ground of their great danger to society.

Correspondence.

PREVENTION OF ANTHRAX.

DEAR SIR,—I am obliged to Mr. Harold Leeney for calling attention to the apparent incompatibility of the constituents of the mixture mentioned in my communication to the Journal; and I freely admit that, in not giving more particulars, I have laid myself open to adverse criticism. In the first place, I should have mentioned that the preparation of soda was the bicarbonate, which he will be aware is not sufficiently alkaline, when first dissolved in water, to saponify oil; the carbolic acid, again, was in solution in glycerine. The mixture was made up in this way: three ounces of bicarbonate of soda were dissolved in water, to this was added eight ounces of whisky, then six drachms of carbolic acid in solution in glycerine, and the bottle—a twenty-four ounce one—filled with oil. A fourth part of this mixture (to which was ordered to be added half-a-tumbler of whisky, and a pint of warm water or gruel) was administered every three hours; the linseed oil was merely added to prevent any excoriation of the mucous surfaces by the carbolic acid. It would, no doubt, have been more correct to have made up the mixture with eggs or milk, but the linseed oil was the most convenient at the time. Be that as it may, it answered the purpose required in the two cases mentioned. My experience in the treatment of Anthrax has been very much like that of Mr. Leeney, up to the present; and I attribute the success in these two cases, in a great measure, to the fact that the medicine was on the spot, and was administered without any delay, so soon as the animals were noticed to be amiss.

If Mr. Leeney will take the trouble to make up the mixture in the way I have directed, and allow it to stand for a short time, he will find that no chemical combination has taken place, but merely a mechanical mixture, and that he will be able, first, to pour off the oil, then the carbolic acid, mixed with the spirit and water, the bicarbonate of soda being left at the bottom. Apologising for troubling you with this explanation.

Bishops Auckland, May 10th. W. J. MULVEY, F.R.C.V.S.

MANGE AND TETANUS.

DEAR SIR,—Your Journal for June, 1884, has come into my hands. At page 469 there is a letter about Red Mange in dogs, and you in a footnote say it is very difficult, or to use your own words "particularly troublesome" to cure. I know a perfect cure for it, which, though applied externally, is so cleanly in its application that it can be used on domestic pets.

It would have afforded me great pleasure to have given you the benefit of my experience, but it has so become the fashion among veterinary surgeons to treat with scorn suggestions made by amateurs, that I withhold my information unless I am paid for it; such payment can be placed in the hands of a referee, and if I am wrong the money can be returned to the inquirer.

I now revert to page 404 of the same issue (some eight lines from the bottom), where my name is mentioned in anything but a complimentary manner, and I would here tell Veterinary Surgeon Gerald H. Fenton that, though he stigmatises my information as that given by an amateur who cannot diagnose a case of Traumatic Tetanus, the cases put forward by me in Colonel Ryves' book were two of them patients of regularly passed M.D.'s and surgeons, and the third was the patient of a member of the same profession, and had diplomas exactly of the same value as those held by the aforesaid veterinary surgeon himself. I maintain that Traumatic Tetanus is

curable, but perhaps not in every case. Idiopathic Tetanus is easily cured; and if any member of the profession wants to know how it is done, they have only to apply to this "amateur," who will enlighten them on being paid for giving the information.

I again repeat, I would gladly have given you the benefit of thirty-six years' experience among horses in India gratis and free for nothing, but for such conceited remarks as those made by Veterinary Surgeon Gerald H. Fenton.

C. L. BROWN, *Major-General,*
Retired Bengal Staff Corps.

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION AND THE NINTH CLAUSE.

SIR,—I have read with regret the long and egotistical letter from Mr. Greaves which appears in your Journal of this month. For any services which Mr. Greaves may have rendered to the veterinary cause, I am sure he will receive due reward from a generous profession, but I venture to think, that had he profited by his boasted experience of more than half a century, it would have suggested to him the propriety of the old adage, that "Self-praise is no recommendation," and that he would have left to other hands the public enumeration of his virtues and sacrifices.

Mr. Greaves claims that the Lancashire Association occupies the position of the first and most powerful association in Great Britain.

It was at a duly-constituted meeting of *this Association* that the resolution to which Mr. Greaves refers was passed by a considerable majority; he, however, alleges that the resolution was passed "at the instigation or dictation of gentlemen, some of whom only *passed into the profession yesterday*—as it were," and further, that "*such men have no locus standi:* they are men who do not know the best interests or politics of their profession; *and who have done little or nothing for it.*"

Of the members who voted for the resolution, four have been presidents, one the treasurer, and four secretaries, and all have been active and zealous supporters of the Association, and devoted to the elevation and promotion of the profession.

With regard to the professional reputation of those members, I fear a comparison with Mr. Greaves would not be to his advantage; and, as for myself, I am quite content to leave the verdict on my social and professional status to those people who know me, and amongst whom I practise.

Mr. Greaves himself alludes to the stormy and critical two years during which I had the honour of being President of the Association, and in which I loyally assisted the Council in their arduous labours in obtaining the Charter.

I cannot help thinking that Mr. Greaves' age and experience should have induced him to refrain from casting reflections on the capacity and services of his fellow-members, and, moreover, particularly when he presumes to lecture them for "*their petty jealousies, petty envy, conceit, and uncharitableness,*" and I trust that in your next issue he will be found to have made the apology which is due to the gentlemen whom he has so wantonly and deliberately maligned.

I have been exceedingly pained that Mr. Greaves should have publicly alleged that any reflection on Dr. Fleming was intended, and I feel sure Dr. Fleming will acquit me of any such intention.

I have known Dr. Fleming from my youth, and I yield to none in my appreciation of his life-long devotion to the profession, and the sterling integrity of his character; nor do I question or undervalue the services or motives of the other gentlemen who were instrumental in obtaining the Charter.

But, at the same time, I am of opinion that by restricting membership of the Council and Examining Board to Fellows, the profession may be deprived of the services of some of the best and most experienced practitioners.

This defect in our great Charter can, and I hope will, be amended.

The question could have been discussed without any heat or personalities.

My experience of our Association induces me to think that the full, free, and temperate discussion of questions of this kind tends to the formation of sound opinion, and in the end to the unity of the profession.

Manchester. ALEXANDER LAWSON, M.R.C.V.S.

SIR,—Your issue of May contains a letter from Mr. Greaves relating to the above Association and its transactions; before attempting a reply I shall await the next meeting of the same, in order to ascertain whether Mr. Greaves is a member or not; if he is a member, it will be my duty to call the attention of the Society to some of the epithets and expressions which the letter contains, and also to question the propriety of a member taking advantage of a public journal to make known and criticise the internal and unpublished proceedings of that Society. If Mr. Greaves is no longer a member, I trust to your courtesy to allow me to say a few words in your next.

JNO. B. WOLSTENHOLME.

MEETINGS OF VETERINARY SOCIETIES.

The next meeting of the Lancashire Veterinary Medical Association will be held at the Blackfriars Hotel, Manchester, on June 9th.

A number of papers have to be held over until next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from G. R. Griffith, A.V.D., Cairo; C. Cunningham, Slateford; R. A. Stock, Lewes; F. Raymond, A.V.D., Woolwich; T. Marriott, A.V.D., Central India; W. R. Williams, London; Major-General C. L. Brown, London; Professor Smith, Ontario; J. A. Munn, A.V.D., Glasgow; G. F. Davis, A.V.D., Madras; C. Gresty, Newcastle-on-Tyne; C. E. Munn, Watertown, Dakota; F. Smith, A.V.D., Aldershot; J. Macqueen, Glasgow; W. O. Williams, Edinburgh; R. Rutherford, Edinburgh; A. Lawson, Manchester; J. B. Wolstenholme, Manchester; G. Gresswell, Louth; C. Hartley, Lincoln; J. W. Ingram, Manchester; R. W. Burke, A.V.D., Cawnpore; A. W. Hill, London; E. E. Bennett, A.V.D., Aldershot.

BOOKS AND PAMPHLETS: *J. M. Wehenkel*, Résumé de l'Etat Sanitaire des Animaux Domestiques pendant 1884; *Dr. Gordon*, New Theory and Old Practice; Bulletin et Mémoires de la Société Centrale de Médecine Vétérinaire; *A. Vachetta*, La Chirurgia Speciale degli Animali Domestici; *C. Hugues*, Der Unterricht in der Veterinärmedizin; *E. Decroix*, Recherches Experimentales sur la Viande de Cheval et sur les Viandes Insalubres.

JOURNALS, ETC.: *Journal of the Royal Agricultural Society of England; La Clinica Veterinaria; Journal of Comparative Medicine and Surgery; Revista Popular de la Exposicion Rural; Quarterly Journal of Veterinary Science in India; Wochenschrift für Thierheilkunde und Viehzucht; Echo Vétérinaire; Recueil de Med. Vétérinaire; American Veterinary Review; Journal de Méd. Vétérinaire; Journal of the National Agricultural Society of Victoria; Lancet; Mark Lane Express; Live Stock Journal; Revue Vétérinaire; American Live Stock Journal; Hufschmied; British Medical Journal; Annales de Médecine Vétérinaire.*

NEWSPAPERS: *Montreal Gazette; Bristol Times and Mirror; Lahore Civil and Military Gazette; Brooklyn Review; Scotsman*, Edinburgh.